



National Pollutant Discharge Elimination System FACT SHEET for

United States Steel Corporation

September 4, 2009

Indiana Department of Environmental Management

100 North Senate Avenue

Indianapolis, Indiana 46204

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Permittee:	Name: UNITED STATES STEEL – GARY WORKS Address: ONE NORTH BROADWAY GARY, INDIANA, LAKE COUNTY
Existing Permit Information:	Permit Number: IN0000281 Expiration Date: August 1999
Receiving Stream:	Lake Michigan and Grand Calumet River
Source Contact: Source Address:	Mr. Robert H. Lange One North Broadway, Gary, Indiana
Proposed Action:	Permit Renewal Date Application Received: August 1999
Source Category	NPDES Major – Industrial
Permit Writer:	Name: Stan Rigney Title: Senior Environmental Engineer Phone No: 317/232-8709

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
(NPDES) PERMIT PROGRAM

FACT SHEET
for
NPDES Permit No. IN 0000281

Corporate Address:

United States Steel LLC
600 Grant Street
Pittsburgh, PA 15230

Facility Address:

USS Gary Works
One North Broadway
Gary, Indiana 46401

ORGANIZATION OF FACT SHEET

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A. **Introduction**

Development of a Fact Sheet for NPDES permits is required by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.6, as well as requirements in the Indiana Administrative Code (IAC) 327, Section 5. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Indiana Department of Environmental Management, as well as the methods by which the public can participate in the process of finalizing those actions.

The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines and other treatment-technology based standards, existing effluent quality, instream biological, chemical, and physical conditions, and the allocations of pollutants to meet the Indiana State Water Quality Standards.

Technology Based Effluent Limits are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the Commissioner may establish technology-based limits based on best professional judgment (BPJ).

IDEM evaluates the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge and the receiving water's characteristics. In accordance with 327 IAC 5-1.5-69, a Wasteload allocation (WLA) is the portion of a receiving water's loading capacity that is allocated to one (1) of its existing or future point sources of pollution. In the absence of a TMDL approved by EPA under 40 CFR 130.7 or an assessment and remediation plan developed and approved in accordance with 327 IAC 5-2-11.4(a), a WLA is the allocation for an individual point source, that ensures that the level of water quality to be achieved by the point source is derived from and complies with all applicable water quality standards.

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ- Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. A PEQ is calculated by multiplying the highest measured value by a statistical factor that accounts for effluent variability and limitations associated with small data sets. For example, if only one sample exists, the factor is 6.2, for two samples – 3.8, for three samples 3.0, etc. The factors continue to decline as the sample size increases. If the pollutant concentrations are fairly constant, but the data set is small, these factors may make the PEQ appear larger than it would be shown to be if more sample results existed.

In addition to the reasonable potential approach detailed above EPA has provided additional guidance to IDEM on determining the need for water quality based effluent limits at the final outfall using TBELs determined appropriate at an internal outfall. This approach is separate from the RPE statistical analysis done during the modeling phase of permit development. Once the TBELs are calculated these are then compared to the WQBELs using the allowed mass calculated for the TBELs. If the TBELs calculated mass exceed the WQBELs mass then there is a reasonable potential to exceed a water quality criterion and WQBELs are required at the final outfall.

B. Permit Chronology

The US Steel permit has been administratively extended since the permit's expiration date of August 24, 1999. The permit has been in the process of renewal since that time. The permit was drafted and first public noticed on July 18, 2003 followed by a Public Hearing on October 8, 2003. The permit did not go to final at that time and several outstanding issues were resolved between 2003 and the July 2007 draft. The revised draft was public noticed again on July 2, 2007. This was followed by two Public Meetings held by IDEM and a Public Hearing held by the USEPA. USEPA submitted to IDEM two separate objection letters which have been subsequently resolved through the revisions in this current draft.

The Fact Sheet and Permit have been modified to reflect many of the comments received during the July 2007 comment period. The major revisions to the July 2007 draft permit and Fact Sheet are summarized below. Through the Public Hearing held by EPA, they received many duplicate comments to what IDEM received during Public Meetings.

To access the information related to this permit on EPA's website the following shortcut is provided: <http://www.epa.gov/region5/sites/ussteel/>

Permit information for the US Steel Gary Works Facility can also be found on IDEM's Web Site at: www.IDEM.in.gov

C. Summary of EPA Permit Objections with Corresponding Resolution

EPA Comments on Water Quality Based Effluent Limitations –

Comment Regarding CBOD₅:

CBOD₅ in discharges from outfall 034 (Attachment IV indicates that a summertime monthly concentration WQBEL of 5.62 mg/l and a wintertime monthly concentration WQBEL of 19.12 mg/l are necessary for that outfall).

Response to Comment 1 -

Under Indiana regulation, the reasonable potential procedure that applies to individual toxic pollutants is not required to be used for pollutants that impact the instream dissolved oxygen such as CBOD₅. The reasonable potential analysis for Outfall 034 in Table 9 is based on the procedure for individual toxic pollutants. Therefore, the

parameter CBOD₅ should not have been included in Table 9 for Outfall 034 and has been removed (see Attached revised Reasonable Potential to Exceed Table 9). The limits for CBOD₅ at Outfall 034 in the 1994 permit were based upon the September 1992 wasteload allocation study for the Grand Calumet River – Indiana Harbor Ship Canal approved by US EPA on January 13, 1993. The limits for CBOD₅ were mass only and were taken from the 1992 wasteload allocation study. The 1992 wasteload allocation said that "the mass loading limits shall apply to all outfalls directly discharging to the receiving water", and "Due to the complication of wastestream connections in some industrial dischargers, the concentration limits, if applicable, are only recommended at the internal outfalls for industrial users." IDEM has not updated the dissolved oxygen model for the Grand Calumet River – Indiana Harbor Ship Canal since 1992. Because there is not a new wasteload allocation for CBOD₅ for the Grand Calumet River, IDEM believes that the limits in the previous permit are still appropriate to use and they were carried over into this permit. The previous permit only contained mass limits for CBOD₅, therefore, the permit renewal only contains mass limits for CBOD₅ at Outfall 034. No changes to the permit were required, but the Reasonable Potential Table for Outfall 34 was corrected.

Comment 2 –

Whole effluent toxicity in discharges from outfall 028/030 (Attachment IV indicates that a chronic toxicity limitation of 2.8 TU_c is necessary for that outfall).

Response to EPA Comment 2 –

US Steel submitted additional Whole Effluent Toxicity Data on June 10, 2008. In addition, both the wasteload allocation tables and the reasonable potential to exceed tables have been updated to include the more recent discharge and flow data. See RPE Table 12. No Reasonable Potential exists for WET at Outfall 028/030.

Comment 3 on Technology Based Effluent Limitations –

To eliminate these objections, the final permit must contain technology based effluent limitations that are consistent with Attachment III to the fact sheet. Such limitations would be included in the permit if it were issued by EPA. Tables in the permit and the attachment should be the same.

Response 3 –

A complete review of the TBEL tables has been completed and all Tables should match the limits in the proposed permit. Where they differ it should be explained in the Fact Sheet. In some instances the TBEL in the permit is more stringent than the calculated TBEL because of a previous permit decision through the use of Best Professional Judgment (BPJ) and/or through the use of antibacksliding.

On November 17, 2008 US Steel submitted additional documentation that indicated that the flow from the metal finishing waste stream could not be justified at a higher flow rate than what was in the 1994 permit and it was requested that the flow be reduced from the

3.4 MGD that was in the 1999 permit renewal application to the 1.98 MGD value used in the 1994 permit. This adjusts downward the calculated mass for all of the parameters of concern related to the metal finishing waste stream that is a component in the calculation for Internal Outfall 604. See calculations for 604 in Attachment III.

Comment 4:

EPA objected to the five year compliance schedules for the following: Benzo(a)pyrene at Outfalls 005 and 010, free cyanide at Outfall 005, chronic whole effluent toxicity at Outfalls 005 and 034, copper Outfalls 018 and 040, ammonia at Outfall 040 and mercury at several Outfalls. EPA in their October 16, 2007 question the compliance schedules in Part III related to the thermal effluent limitations. Additional information was requested from US Steel through the 308 process.

Response 4:

After review of the additional information submitted by US Steel including requests to remove some of the affected outfalls (for example Outfall 040 has been removed from the permit), the compliance schedules were adjusted to the following: A 34 month schedule for Benzo(a)pyrene and Whole Effluent Toxicity (WET) at Outfall 005, a 24 month schedule for Benzo(a)pyrene at Outfall 010 and 5 year schedules for Mercury at all of the affected outfalls. EPA now concurs with the thermal effluent related compliance schedules that were in the 2007 draft, these have been retained in this permit.

Comment 5

Whole effluent toxicity in discharges from outfall 034 (Attachment IV indicates that a chronic toxicity limitation of 3.1 TU_c is necessary for discharges from that outfall, but the draft permit contains a chronic toxicity limitation of 3.3 TU_c).

Response 5 –

The reasonable potential analysis for whole effluent toxicity in Table 15 (2007 draft) had not been updated since the Fast Track rulemaking was approved by US EPA on October 3, 2005 (water quality standards) and on March 2, 2006 (NPDES regulations). The Fast Track rulemaking changed the manner in which wasteload allocations for whole effluent toxicity are translated into permit limits. Instead of being statistically derived, the monthly average is now equal to the chronic wasteload allocation and the daily maximum is now equal to the acute wasteload allocation. Therefore, the prior statistically derived limit of 3.1 TU_c should have been replaced by the wasteload allocation value of 3.3 TU_c. The monthly average limit for Outfall 034 was correctly listed as 3.3 TU_c in the permit. The reasonable potential table has been corrected and updated based on a new wasteload allocation for WET (see Attached revised Reasonable Potential Table 12). Based upon updates to the model the water quality based effluent limit for Chronic Wet at this outfall is 3.6 TU_c. This has been incorporated into the permit and fact sheet.

EPA Comment 6 - Antidegradation

The draft permit had less stringent limits for lead at Internal Outfall 603 than the previous permit.

The draft permit contains new effluent limitations applicable to discharges of total recoverable chromium, cadmium, copper, nickel, silver, total cyanide, total toxic organics, and hexavalent chromium through internal outfall 604. Except for total recoverable chromium, the previous permit did not contain limitations for these parameters; and with respect to total recoverable chromium, the draft permit appears to authorize an increase in loadings. It is not clear, in light of this information, whether the draft permit and these limitations meet the antidegradation requirements of the State's water quality standards as required by 40 CFR 122.44(d) and 123.25(a)(14). IDEM needs to provide information in the fact sheet or elsewhere in the administrative record demonstrating that these requirements have been met before IDEM issues the final permit. EPA would take such actions if it were the permitting authority.

IDEM Response 6 –

Because the WQBEL for lead at final outfall 028/030 is more stringent than the TBEL calculated for the internal outfall, report only requirements were allowed at the internal outfall for this parameter. The effluent limitations for Internal Outfall 604 in the 2007 draft permit have been updated so the following response is based on the updated limitations. Technology-based effluent limitations for total chromium were applied at the final outfall in the current permit and were moved to the internal outfall in the proposed permit. The TBELs for total chromium in the proposed permit at Internal Outfall 604 are more stringent than the effluent limitations in the current permit at Outfall 034 so they do not authorize an increase. New TBELs for hexavalent chromium are being applied to Internal Outfall 604 in the proposed permit. Technology-based effluent limitations for hexavalent chromium were authorized under the current permit, but were not applied. The new TBELs for hexavalent chromium are equivalent to those that were authorized, but not applied in the current permit. Therefore, the new TBELs for hexavalent chromium do not authorize an increase. New TBELs for cadmium, copper, nickel, silver, total cyanide and total toxic organics are being applied to Internal Outfall 604 in the proposed permit. The TBELs were authorized under the current permit, but were not applied. The same flow was used to calculate the TBELs for the proposed permit as would have been used in the current permit, so the new limits do not allow an increase above what was authorized, but not applied in the current permit. Therefore, the new TBELs for these parameters do not authorize an increase. A complete antidegradation review of the proposed permit is included in Section C. Because the WQBEL for copper, silver and cadmium are more stringent at the final Outfall than the TBELs calculated for the internal outfall, report only requirements were allowed at the internal for these three parameters.

Comment 7 Cooling Water Intake Structures (316(b)) requirements – In general the states have to make a BTA (Best Technology Available) determination on the Intake Structures.

Response 7: USS submitted information related to the intakes and a joint site visit by IDEM and US EPA Region V occurred. See Part IV. of the permit for the BTA determination and a general description of the process later in the Fact Sheet.

D. Summary of Major Changes to the Permit from the July 2007 Draft

1. IDEM has updated the modeling spreadsheets. The permit and Fact Sheet have been modified to reflect these changes. The discharge flows now reflect the long term average (Outfall 005 is the highest monthly average) for the period reviewed. Changes in flows affect the mass calculations at each outfall. All revised tables have been included in the Fact Sheet.
2. Removal of Outfall 040 from the permit. Per correspondence from US Steel dated November 26, 2008, US Steel requested that the discharge from Outfall 040 to Stockton Pond be removed from the NPDES permit. The discharge was from the Electrogalvanizing Line (EGL) which had already been idled. US Steel will plug Outfall 040 before the effective date of the permit. The discharge limitations table has been removed from this permit. This also removes Stockton Pond from being classified as a receiving water.
3. Removal of Water Quality Based Limits for Copper at Outfall 018. Further evaluation of the dissolved metal data did not show a reasonable potential to exceed for this parameter. Although the numeric limits have been removed the permit still requires the reporting of Copper at this outfall.
4. Revision to the Federal Effluent Guidelines for the Coke Plant (Internal Outfall 501). The US Steel Permit was first modified to include effluent limitations for the Coke Plant in 1999. The technology limits were based upon the New Source Performance Standards in 420.14, promulgated in 1982. 40 CFR Part 420 was revised in 2002. US Steel received the NSPS limits for the Coke Plant effective January 1999. 40 CFR 420.13(a) provides for a 10 year window in which the limits cannot become more stringent due to revisions to the guidelines. That 10 year window expired in January 2009. Therefore, the permit has been modified to include the applicable limits from 40 CFR 420.13(a) (BAT - updated in 2002) for the toxic and nonconventional pollutants and 420.14 (1982 NSPS) for TSS and Oil and Grease. The revised guidelines dropped limit requirements for Benzene.

The permit and Fact Sheet along with the TBEL Tables have been updated to reflect both the most recent production data provided by US Steel on April 19, 2007 and the revisions to the guidelines. Because US Steel now qualifies for the revised BAT there are no limits for TSS and Oil and Grease. Normally you would revert back to BPT/BCT limitations, but since US Steel is capable of meeting the older NSPS for these parameters they are being retained in the permit through the use of Best Professional Judgment (BPJ). TSS and Oil & Grease will be based on the formerly promulgated BPT/BCT limitations (must continue to achieve the standards specified in 40 CFR 420.14, revised as of July 1, 2001) corresponding to the BPT/BCT segment applicable to the US Steel or on the 1982 NSPS for conventional pollutants, whichever is more stringent. For toxic and

nonconventional pollutants a comparison between the revised BAT limits and the 1982 NSPS limits with the more stringent of the two used for each parameter.

In addition to the parameters covered under the effluent limitation guidelines, US Steel is required to monitor for Free Cyanide at this outfall. The revised effluent guidelines no longer include Benzene as a regulated parameter of concern, however because USS was granted permission to include coke plant area contaminated groundwater which is high in Benzene, the calculated limits for Benzene from the previous NSPS are held in this permit using BPJ.

5. Changes to both the production quantities and effluent guidelines provide for the discharge of less ammonia than was approved in the previous permit or even the previous drafts of this permit from Outfall 005 via Outfall 501 and Outfall 010 via Outfall 508. The ammonia limits that were being carried over from the previous permit at the final outfalls have now been removed. Based upon an evaluation of the concentrations of ammonia in Outfall 005 and 010, no reasonable potential exists at these outfalls. Monitoring requirements for ammonia at both Outfalls shall remain in the permit.
6. US Steel has requested that the reported metal finishing wastewater flow be reduced back to the flows in the previous permit. Based upon this request the Metal Finishing Waste Stream calculated Technology Based Effluent Limits (TBELs) were adjusted downward to reflect the decrease flow value. This adjusted the TBELs for most parameters at the Internal Outfall 604.
7. EPA recently modified their approach to handling stormwater related to industrial activity. EPA handles this through the multi-sector general stormwater permit. EPA has determined that it is appropriate to include in addition to the stormwater pollution prevention plan additional permit conditions that address both technology equivalent (BAT/BCT/BPT) and water quality. IDEM has included in this draft a similar version of these conditions. Part I.J. and Part I. K. of the permit have been revised to reflect this. Stormwater language is further explained later in this Fact Sheet.
8. IDEM is required to make a BTA determination using Best Professional Judgment (BPJ) so the permit will comply with the Clean Water Act 316(b). A BPJ determination for BTA (Best Technology Available) is now included in the permit with a write up in the Fact Sheet.
9. United States Steel on November 26, 2008 indicated that Outfall 017 will no longer discharge and can be removed from the permit. The Outfall will not have a discharge by the permit effective date and will be physically closed by June 30, 2009. This permit no longer will contain Outfall 017.
10. United States Steel on November 26, 2008 indicated that internal outfall (Outfall 508) no longer has the potential to discharge and can be removed from the permit. This internal outfall has been in the permit for several years and has never discharged. Outfall 508 has been removed from the permit.

11. IDEM updated all of the reasonable potential tables using more recent effluent data. Data used was collected by U.S. Steel during the period January 2005 through April 2008 in accordance with the current permit and reported on monthly monitoring reports (MMRs).
12. A re-evaluation of ELG limits has been completed. Based upon this re-evaluation the mass limits calculated at Internal Outfall 603 were reduced to the more stringent limits developed in the previous permit. The facility is capable of and has been meeting the more stringent limits consistently and it was determined that anti-backsliding prevented those limits from being increased.
13. Because more recent MMR data was used this affected the flows for each outfall used in the permitting process. This changed some of the Water Quality Based Effluent Limits (WQBELs) and the calculated mass values (flow dependent) for all parameters at all final outfalls.

E. Use Classifications:

The Grand Calumet River is designated for full-body contact recreation; shall be capable of supporting a well-balanced, warm water aquatic community; and, is designated as an industrial water supply. The Indiana portion of the open waters of Lake Michigan is designated for full-body contact recreation; shall be capable of supporting a well-balanced warm water aquatic community; is designated as salmonid waters and shall be capable of supporting a salmonid fishery; is designated as a public water supply; is designated as an industrial water supply; and, is designated as an outstanding state resource water. These waterbodies are identified as waters of the state within the Great Lakes system. As such, they are subject to the water quality standards and associated implementation procedures specific to Great Lakes system dischargers as found in 327 IAC 2-1.5, 327 IAC 5-1.5, and 327 IAC 5-2.

303(d) listed segments – the US Steel facility discharges along a five mile stretch of the Grand Calumet River and to the open waters of Lake Michigan. As of the 2008 303(d) List of Impaired Waters, the following impairments were listed for waters to which US Steel discharges.

Assessment Unit INC0122_00 (Grand Calumet River - Headwaters) is a 3.28 mile segment listed for Ammonia, Cyanide, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins at the outlet of the culvert about 1900 feet upstream of Outfall 005 and extends to a point 0.5 miles upstream of Bridge Street. The US Steel Outfalls that discharge to this assessment unit are 005, 010, 015, 018, 019, 020, 021, 023, 028/030, 032 and 033.

Assessment Unit INC0122_T1097 (Grand Calumet River – Gary to Indiana Harbor Canal) is a 6.59 mile segment listed for Cyanide, *E. coli*, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins at a point about 0.5 miles upstream of Bridge Street and extends down to the Indiana Harbor Canal. US Steel Outfall 034 discharges to this assessment unit.

Assessment Unit INC0121G_G1074 (Lake Michigan Shoreline East of Indiana Harbor Canal) is listed for Mercury and PCBs in Fish Tissue. The US Steel outfalls that discharge to this assessment unit are 035, 037, 039 and 041A & 041B.

Assessment Unit INM00G1000_00 (Lake Michigan) is listed for Mercury and PCBs in Fish Tissue.

A TMDL for *E. coli* for the Lake Michigan Shoreline (including Assessment Unit INC0121G_G1074) was approved by U.S. EPA September 1, 2004 and is included in the Lake Michigan Shoreline TMDL. This TMDL does not place limits for *E. coli* on any of the US Steel outfalls to Lake Michigan.

Since the 2008 303(d) List of Impaired Waters was approved by U.S. EPA, IDEM has reevaluated Assessment Unit INC0122_00 to determine whether it properly accounts for the nature of the Grand Calumet River within the segment. The portion upstream of Outfall 005 consists of water flowing from the Marquette Park Lagoons and some backflow from Outfall 005. In addition to the large discharge of water starting at Outfall 005, site-specific water quality criteria for Free Cyanide in 327 IAC 2-1.5-16(g), Table 16-1 apply from Outfall 005 to a point one mile downstream. Outfall 018 adds a large volume of water downstream of this one mile segment followed by other outfalls with large discharge volumes.

Considering the nature of Assessment Unit INC0122_00, IDEM is proposing to split this assessment unit into three units in the 2010 303(d) List. Assessment Unit INK0346_01 will begin at the outlet of the culvert and end about 1900 feet downstream at Outfall 005. Assessment Unit INK0346_02 will begin at Outfall 005 and end one mile downstream. Assessment Unit INK0346_03 will begin one mile downstream of Outfall 005 and end about 0.5 miles upstream of Bridge Street. In addition, Assessment Unit INC0122_T1097 will become Assessment Unit INK0346_04 in the 2010 303(d) List.

The splitting of Assessment Unit INC0122_00 into three assessment units allows IDEM to make use assessments using data representative of the individual units. Data from Fixed Station GCR-46 had been used to make assessments for all of Assessment Unit INC0122_00. This station was located at the outlet of the culvert upstream of Outfall 005 and in October 2007 was moved to a location upstream of the inlet to the culvert. Since at least January 2004, the water sampled at Fixed Station GCR-46 has been upstream flow and has not included backflow from Outfall 005. The volume of flow sampled at Fixed Station GCR-46 is small in comparison to the volume of flow added by US Steel beginning at Outfall 005. Therefore, the data collected at Fixed Station GCR-46 are representative of flow upstream of Outfall 005, but not of the flow in the Grand Calumet River beginning at Outfall 005. The upstream flow includes flow from the Marquette Park Lagoons. Data representative of the Grand Calumet River beginning at Outfall 005 would include instream data such as that collected at IDEM Fixed Station GCR-42 at Bridge Street and data collected at the US Steel outfalls.

The dredging of the five mile stretch of Grand Calumet River along the US Steel property was completed in December 2003. Therefore, IDEM now has five years of data, starting

January 2004 and ending December 2008, collected at two fixed stations to make use assessments. Fixed Station GCR-42 at Bridge Street is just downstream of proposed Assessment Unit INK0346_03 and Fixed Station GCR-37 at Kennedy Avenue is upstream of the end of Assessment Unit INK0346_04. The most recent five years of data from Fixed Station GCR-42 show that the Grand Calumet River is not impaired for Ammonia or Cyanide. The most recent five years of data from Fixed Station GCR-37 show that the Grand Calumet River is not impaired for Cyanide.

Proposed Assessment Unit INK0346_02 has a site-specific criterion for Free Cyanide and Outfalls 005 and 010, which are included in this Assessment Unit, are sources of cyanide. Proposed Assessment Unit INK0346_03 contains several large sources of noncontact cooling water (Outfalls 018, 019, and 020) that dilute the flow from proposed Assessment Unit INK0346_02 prior to Fixed Station GCR-42. Therefore, IDEM conducted monthly sampling at Tennessee Street, which is in proposed Assessment Unit INK0346_02 and downstream of Outfalls 005 and 010, and at Virginia Street, which is in proposed Assessment Unit INK0346_03 and downstream of Outfall 018, for Ammonia and Cyanide from March 2009 through June 2009. The data showed that proposed Assessment Unit INK0346_02 is not impaired for Cyanide when the data are compared to the site-specific criterion for Free Cyanide and proposed Assessment Unit INK0346_03 is not impaired for Cyanide when the data are compared to the normal criterion for free cyanide. However, the data did show that both proposed Assessment Units INK0346_02 and INK0346_03 are impaired for Ammonia. From the stream data and U.S. Steel data for Outfalls 005 and 010, it appears that an unknown source of ammonia enters the Grand Calumet River upstream of Tennessee Street and the ammonia concentration is diluted below the criterion between Outfall 018 and Fixed Station GCR-42.

Based on the data from Fixed Station GCR-42 and additional sampling at Tennessee Street and Virginia Street, IDEM considers the Grand Calumet River in proposed Assessment Units INK0346_02 and INK0346_03 to not be impaired for Cyanide, but to still be impaired for Ammonia. Based on the data from Fixed Station GCR-37, IDEM considers the Grand Calumet River in Assessment Unit INK0346_04 to not be impaired for Cyanide. The decision to change the impairment status based on more recent and more representative data was taken into account in the US Steel permit renewal. This decision will also be proposed as part of the 303(d) listing cycle. IDEM has not reassessed the Grand Calumet River for any of the other parameters included on the 303(d) List.

With the splitting of assessment units and the reassessment for Ammonia and Free Cyanide, the following impairments remain for the portions of the Grand Calumet River along the US Steel property.

Assessment Unit INK0346_01 is impaired for Ammonia, Cyanide, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins at the outlet of the culvert about 1900 feet upstream of Outfall 005 and extends to Outfall 005. No US Steel outfalls discharge to this assessment unit.

Assessment Unit INK0346_02 is impaired for Ammonia, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins at Outfall 005 and extends to a point one mile downstream. The US Steel Outfalls that discharge to this assessment unit are 005, 010 and 015.

Assessment Unit INK0346_03 is impaired for Ammonia, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins one mile downstream of Outfall 005 and extends to a point about 0.5 miles upstream of Bridge Street. The US Steel Outfalls that discharge to this assessment unit are 018, 019, 020, 021, 023, 028/030, 032 and 033.

Assessment Unit INK0346_04 is impaired for *E. coli*, Impaired Biotic Communities, Oil and Grease and PCBs in Fish Tissue. This assessment unit begins at a point about 0.5 miles upstream of Bridge Street and extends down to the Indiana Harbor Canal. US Steel Outfall 034 discharges to this assessment unit.

A brief discussion of some of the parameters for which Grand Calumet River has not been reassessed and is still considered impaired follows:

Impaired Biotic Community – The dredging of the five mile stretch along the US Steel property was completed in December 2003. This should improve the conditions in the Grand Calumet River as it relates to the Biotic Community.

Oil and Grease – The Oil and Grease data is a historical impairment from the information gathered in the 1980s. This needs to be reassessed now that the dredging work has been completed. The technology based limits for Oil and Grease in this permit are within the same levels as in the previous permit. US Steel typically discharges below these limits. An Outfall by Outfall discharge evaluation was completed for the months from April 2007 thru April 2008 and the data is summarized as follows. Oil and Grease discharges for the most part are at or below the limit of detection (2.0 mg/l). The limit of quantitation for the test method is 5 mg/l. In August of 2007 Outfall 028 discharged O&G at 9.5 mg/l. Outfall 030 was at 6.7 mg/l. These values are still well within permitted limitations. In July 2007 Outfall 020 discharged at 5.2 and 035 discharged at 15 mg/l. Based upon this analysis a new footnote will be added to the predominately non-contact cooling water outfalls (Outfalls 18, 19, 20, 35, 37, and 39) that will require USS to investigate and eliminate sources of Oil and Grease when detection of Oil and Grease in the discharge (concentrations above 5 mg/l) is measured. This is in addition to the visual inspections of the Outfalls on a daily basis. See Part I.O. of the permit for the VOCAMP requirements.

<http://www.in.gov/idem/4680.htm>

[link to water quality-limited database – 303d list]

<http://www.in.gov/idem/4676.htm>

[link to TMDL web site]

F. Great Lakes System Discharger Requirements:

The permittee discharges to a waterbody that has been identified as a water of the state within the Great Lakes system. In addition to OSRW antidegradation implementation procedures, it is subject to other NPDES requirements specific to Great Lakes system dischargers under 327 IAC 2-1.5 and 327 IAC 5-2-11.2 through 327 IAC 5-2-11.6. These rules address water quality standards applicable to dischargers within the Great Lakes system and reasonable potential to exceed water quality standards procedures.

As required by 327 IAC 5-2-11.3(b)(2), Part II.A.16. of the renewal permit specifically prohibits the permittee from undertaking deliberate actions that would result in new or increased discharges of BCC's or new or increased permit limits for non-BCC's, or from allowing a new or increased discharge of a BCC from an existing or proposed industrial user, without first proving that the new or increased discharge would not result in a significant lowering of water quality, or by submission and approval of an antidegradation demonstration to the IDEM.

G. Description of Facility

1. General

United States Steel (USS) - Gary Works facility is the largest fully integrated steel mill in North America, with capacity to produce over 8 million tons of raw steel per year. Intermediate and final products include coke, sinter, iron, raw steel, cast steel, plate, hot strip, cold rolled strip and coated steels.

Following are production rates reported by USS in its NPDES permit application for operations limited by 40 CFR 420, which comprises the effluent limitations guidelines for the Iron and Steel Manufacturing Point Source Category:

	tons/day
Cokemaking	3,950
Ironmaking	19,290
Steelmaking	25,115
Vacuum Degassing	5,922
Continuous Casting	22,467
Hot Forming	
Plate	2,797
Hot Strip	18,432
Acid Pickling	
Sulfuric	1,989
Hydrochloric	10,887
Cold Rolling	23,859
Alkaline Cleaning	6,373
Hot Coating	
Galvanizing	1,451

USS also operates electro-plating operations for chromium, tin and zinc plating, which are regulated by 40 CFR Part 433 - Metal Finishing Point Source Category. The production rates listed above represent the highest monthly production rate achieved over a recent five year period, prorated to a daily basis.

2. Existing Discharges

As described below, the USS Gary Works facility has a large number of process and cooling water outfalls discharging to the Grand Calumet River and Lake Michigan. These discharges are limited by a combination of 40 CFR Parts 420 and 433, ambient water quality standards adopted by the Indiana Water Pollution Control Board, and limitations from the previous permit whichever are the more stringent.

Attachment I is a facility map showing the approximate locations of the active process and cooling water outfalls. Attachment II is a series of outfall schematic diagrams showing contributing sources and approximate discharge flow rates.

The outfall number, latitudes and longitudes, receiving water, flow and sources of water discharged are presented below for each outfall. The flow rates for Outfalls discharging to the Grand Calumet River are based upon the average flows determined for the period from January 2006 through December 2007. Flow rates to Lake Michigan are based upon the highest monthly average flow during January 2006 through December 2007. Outfall 005 and combined Outfall 005/010 flow is the highest monthly average for Outfall 005 and the long term average flow for Outfall 010 for the monitoring period January 2006 through December 2007. These are the flow values used in the modeling process to determine the PELs, and in calculating mass limits at the corresponding final outfalls. IDEM has updated the reasonable potential tables using more recent discharge data.

a. Outfall 001 - Grand Calumet River

North Latitude: 41-36-30.6
West Longitude: 87-18-19.4

This Outfall has been closed. It has been removed from the permit.

b. Outfall 003 - Grand Calumet River

North Latitude: 41-36-31
West Longitude: 87-18-22.7

This Outfall has been closed. Outfall 003 has been removed from the permit.

c. Outfall 004 - Grand Calumet River

North Latitude: 41-36-31
West Longitude: 87-18-25.2

US Steel has declared Outfall 004 as inactive and has been removed from the permit.

- | | | | |
|---|---------------------|------|-----|
| d. Outfall 005 - Grand Calumet River | long term average | 43.5 | MGD |
| | max monthly average | 60.4 | MGD |
| Outfall 005 after Outfall 010 combination | | 61.2 | MGD |

North Latitude: 41-36-31
West Longitude: 87-18-28.4

The discharge from Outfall 005 is composed of booster house condenser cooling water, primary gas cooler heat exchangers 1-6 cooling water, miscellaneous coke plant cooling water, distillation area heat exchanger cooling water, ammonia still non-contact cooling water, No. 2 boiler house steam condensate, coke plant tank farm barometric condenser, steam condensate, battery service water freeze protection, primary gas cooler heat exchangers 7&8 cooling water, and storm water runoff. In addition, this outfall receives flows from the coke oven gas desulfurization unit non-contact cooling water (formerly monitored as Internal Outfall 502) and Internal Outfall 501 (treated coke plant effluent - which includes both coke plant process water and remediation groundwater).

- e. Outfall 007 - Grand Calumet River

This Outfall has been closed and has been removed from the permit.

- f. Outfall 010 - Grand Calumet River 0.83 MGD

North Latitude: 41-36-29.2
West Longitude: 87-18-59

The discharge from Outfall 010 is composed of air compressor non-contact cooling water, miscellaneous coke plant non-contact cooling water, battery service water freeze protection, #2 battery roof drain, and storm water runoff.

US Steel has requested and the permit has provided for the re-direction of all flows currently being discharged through Outfall 010 to be combined with the discharge of Outfall 005. A second discharge limitation table for Outfall 005 was added to the permit that will become effective when this action occurs.

- g. Outfall 015 - Grand Calumet River 1.7 MGD

North Latitude: 41-36-27.4
West Longitude: 87-19-19.6

The discharge from Outfall 015 is composed of No. 3 sinter plant non-contact cooling water, PCI east non-contact cooling water, No. 3 sinter plant compressor

non-contact cooling water, storm water runoff, and steam condensate. In addition this outfall receives flow from Internal Outfall 607. Internal Outfall 607 consists of treated landfill leachate, vacuum truck, truck wash, and decant pad water.

h. Outfall 017 - Grand Calumet River

NA

North Latitude: 41-36-28.1

West Longitude: 87-19-39

The discharge from Outfall 017 was composed of miscellaneous non-contact cooling water, steam condensate, freeze protection water, and storm water. In a January 22, 2007 letter to IDEM, US Steel requested that this be designated as a storm water only outfall. The freeze protection water and other non-process water have been looped to the Blast Furnace Recycle System.

Per additional correspondence from US Steel dated November 26, 2008 this Outfall will now be taken completely out of service prior to the effective date of this permit. The final closure of Outfall 017 will be completed by June 30, 2009. **Outfall has been removed from permit.**

i. Outfall 018 - Grand Calumet River

58.2 MGD

North Latitude: 41-36-27.4

West Longitude: 87-19-42.2

The discharge from Outfall 018 is composed of PCI west cooling water, No. 4, 6, and 8 blast furnace shell non-contact cooling water, sinter plant non-contact cooling water, No. 1 electric power station non-contact cooling water, turbo blower boiler house cooling water and boiler blowdown, No. 4 electric power station non-contact cooling water, stock house miscellaneous steam condensate, miscellaneous air conditioner condensate, and some storm water. In addition, SOF-6 (No. 6 Sanitary Lift Station Emergency Overflow) discharges to Outfall 018 in emergency conditions only.

j. Outfall 019 - Grand Calumet River

49.3 MGD

North Latitude: 41-36-27.7

West Longitude: 87-19-51.2

The discharge from Outfall 019 is composed of No. 13 blast furnace shell non-contact cooling water, No. 2 Q-BOP shop miscellaneous non-contact cooling water, turbo-blower boiler house condenser non-contact cooling water, No. 4 boiler house steam condensate non-contact cooling water, No. 1 electric power station non-contact cooling water for No.1 blast furnace condenser, storm water runoff, central water treatment plant brine regenerant water, and No. 5 electric power cooling station condensate.

k. Outfall 020 - Grand Calumet River 80.6 MGD

North Latitude: 41-36-27.7
West Longitude: 87-20-0.2

The discharge from Outfall 020 is composed of No. 1 basic oxygen shop miscellaneous non-contact cooling water, No.1 continuous caster miscellaneous non-contact cooling water, steam condensate, and storm water runoff.

l. Outfall 021 - Grand Calumet River 0.6 MGD

North Latitude: 41-36-28.1
West Longitude: 87-20-1.7

The discharge from Outfall 021 is composed of air compressor non-contact cooling water, air conditioning and steam condensate, and storm water runoff.

m. Outfall 023 - Grand Calumet River 0.1 MGD

North Latitude: 41-36-27.4
West Longitude: 87-20-7.1

The discharge from Outfall 023 is composed of air conditioning condensate, steam condensate, and storm water runoff.

n. Outfall 026 - Grand Calumet River NA

North Latitude: 41-36-27.7
West Longitude: 87-20-15.7

Outfall 026 is currently listed as inactive by US Steel. If a discharge were to occur it could consist of the following: miscellaneous building air conditioning condensate, steam condensate, and storm water runoff DA#18.

o. Outfall 028/030 (600) - Grand Calumet River 28.2 MGD (8.2 and 20.0)

Outfall 028 North Latitude: 41-36-34.6
West Longitude: 87-20-26.9

Outfall 030 North Latitude: 41-36-36
West Longitude: 87-20-46

Discharge from Outfalls 028/030 are lagoon outfall discharges and consist of the #2 continuous caster non-contact cooling water and other miscellaneous non-contact cooling waters, #1 BOP/Q-BOP cooling tower blowdown, storm water runoff, steam condensate, 160"/210" plate mill scale pit, and slab spray cooling, and Q-BOP vacuum degasser overflow. Discharge from internal outfall 603

discharges through Outfall 028/030. Internal Outfall 603 consists of #1 BOP, vacuum degasser, Q-BOP, #2 continuous caster A/B line, #2 continuous caster C line, #1 continuous caster line.

p. Outfall 032 - Grand Calumet River 0.3 MGD

North Latitude: 41-36-34.6

West Longitude: 87-20-51.4

The discharge from Outfall 032 is comprised of QA miscellaneous non-contact cooling water, miscellaneous bar mill freeze protection water, steam condensate, and stormwater from the Bar Mill and Billet Storage Areas. In addition emergency overflows from the No. 3 sanitary lift station emergency overflow (SOF-3). As part of the US Steel passive dewatering discharge for the dredging of the Grand Calumet River (GCR), Outfall 001 from permit No. IN0061077 discharges to US Steel Outfall 032. Final sampling for both outfalls is completed prior to the commingling of these individual wastewaters.

q. Outfall 033 - Grand Calumet River 0.2 MGD

North Latitude: 41-36-26

West Longitude: 87-21-11

The discharge from Outfall 033 is comprised of miscellaneous sheet & tin mill non-contact cooling water, atmospheric gas plant non-contact cooling water, Buchanan Street sanitary lift emergency overflow (SOF-51), Railroad Kirk Yard, steam condensate, and storm water from the Tin Plate areas, Atmospheric Gas Plant, and the Sheet Mill.

r. Outfall 034 - Grand Calumet River 25.4 MGD

North Latitude: 41-36-31

West Longitude: 87-18-28.4

The discharge from Outfall 034 is comprised of treated process water from three internal outfalls:

Internal Outfall 604

North Latitude: 41-37-34.7

West Longitude: 87-22-23.5

Consists of process wastewater from the No. 1 Tin-free Steel lines, East galvanizing lines, chrome reduction floor drains, spent chromic solutions from the Tinning and Galvanizing lines, No.1 Electrogalvanizing, Sheet Mills, 84" Hot Strip Mill, Pickling lines, and Tinning lines.

Internal Outfall 605

North Latitude: 41-37-40.1

West Longitude: 87-22-10.6

Consists of discharges from the 84" Hot Strip Mill wastewater treatment plant.

Internal Outfall 606	North Latitude:	41-37-29.3
	West Longitude:	87-22-09.5

Consists of non-contact cooling water from the Sheet and Tin Mill, PVS Technology manufacturing, 5 stand cold reduction mill, North Sheet Mill Annealing, No. 6 Galvanizing, No. 8 Galvanizing, Waste Acid Recycling Facility, steam condensate, PVS Technology Manufacturing Condensate, and storm water. In addition, emergency overflow from the "N", "S", and "T" process water pumping stations discharge from this outfall.

s. Outfall 035 - Lake Michigan 156.8 MGD

North Latitude:	41-37-39
West Longitude:	87-19-35.8

The discharge from Outfall 035 is comprised of No. 13 Blast Furnace non-contact cooling water, Co-Generation Plant and No. 5 Power Station, steam condensate, and storm water runoff.

t. Outfall 036 - Lake Michigan NA

North Latitude:	41-37-32.2
West Longitude:	87-20-9.6

The discharge from Outfall 036 is comprised of 160"/210" Plate Mill non-contact cooling water, steam condensate, and storm water runoff. As part of the sale of the Plate Mill Assets to ISG, Outfall 036 has now been permitted separately by ISG as permit No. IN0062197 issued on September 19, 2005. **Outfall 036 has been removed from this permit.**

u. Outfall 037 - Lake Michigan 3.0 MGD

North Latitude:	41-37-39
West Longitude:	87-21-25

The discharge from Outfall 037 is comprised of North Sheet Mill annealing cooling water, 80" Temper Mill non-contact cooling water, steam condensate, No. 10 air compressor, and storm water runoff.

v. Outfall 039 - Lake Michigan 55.0 MGD

North Latitude:	41-37-45.8
West Longitude:	87-21-59.8

The discharge from Outfall 039 is comprised of 84" HotStrip Mill Reheat Furnace non-contact cooling water, 84" Hot Strip Mill Miscellaneous non-contact cooling water, 84" Hot Strip Mill fire water distribution system, Steam condensate, cold well pump room flood protection, 84" Hot Strip Mill Roughing Mill scale pit emergency overflow, and storm water runoff.

w. Outfall 040 - Stockton Pond

NA

North Latitude: 41-36-31
West Longitude: 87-18-28.4

Per correspondence from US Steel dated November 26, 2008 this Outfall will now be taken completely out of service prior to the effective date of this permit. The final closure of Outfall 040 will be completed by June 30, 2009. **Outfall 040 has been removed from this permit.**

x. Outfall 041A & B - Lake Michigan

0.086 MGD

Outfall 041A North Latitude: 41-37-13
West Longitude: 87-19-31.1

Outfall 041B North Latitude: 41-36-47
West Longitude: 87-19-31.3

Since the permit renewal application was submitted in 1999, US Steel determined that this outfall was not inactive and discharges were in fact occurring from two separate discharge locations. These were re-designated as Outfall 041A & B. US Steel has indicated that discharges have been occurring from these two points since the 1940's. The discharge became visible on November 22, 2000 when the level of Lake Michigan dropped below the level where the discharge became apparent. During the time period before the lake level dropped, US Steel reported no flow for the outfall. That mistake was rectified after the discharge of water was observed. The estimated flow of the outfall is 0.043 MGD per transformer, resulting in a total flow of 0.086 MGD per day. The discharge is non-contact cooling water from the north and south ore yard rectifiers.

y. Outfalls BW-1 thru BW-5 Lake Michigan

BW-1 North Latitude: 41-36-58.7
West Longitude: 87-19-41.2

BW-2 North Latitude: 41-37-27.1
West Longitude: 87-19-31.4

BW-3 North Latitude: 41-36-36
West Longitude: 87-19-21.7

BW-4 North Latitude: 41-36-55.4
West Longitude: 87-19-13.8

BW-5

North Latitude: 41-37-52
West Longitude: 87-22-26.8

The discharges from Outfalls BW-1 thru BW-5 are composed of intake screen backwashes from the five service water pumping stations operated by USS.

z. Storm Water Discharges

US Steel-Gary Works submitted EPA Application Form 2F - Application to discharge storm water discharges associated with Industrial Activity. The previous permit regulated 15 storm water discharge outfalls. Since that permit was issued three of these outfalls have been closed (001,003, and SW09), four of the outfalls do not discharge any flow and are considered inactive (004, SW03, SW04, and SW07), and eight are monitored semi-annually (SW01, SW02, SW06, SW08, SW10, and SW11). One additional Outfall SW-12 (Railroad Kirk Yard) has been added to the monitoring program. Storm water Outfall 134 discharges to the Mason Basin #5 and does not discharge to a water body so twice yearly monitoring requirements are not being required at Mason Basin #5. Gary Works has a Storm Water Pollution Prevention Plan and it has been updated as required. The last revision to this plan was October 2007. The updated Storm Water Pollution Prevention (SWPPP) was submitted to IDEM on January 8, 2008 to become part of the permit renewal application.

H. Development of Proposed Effluent Limitations and Special NPDES Permit Conditions

1. Clean Water Act Requirements

Section 402 of the Clean Water Act (CWA) establishes a National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES permit program is designed to limit the discharge of pollutants into navigable waters of the United States through a combination of various requirements including technology-based and water quality-based effluent limitations. The CWA provides that the Administrator of U.S. EPA, or his designee, must concur with major permits issued by delegated state agencies. The NPDES permit program for Indiana was delegated to the Indiana Department of Environmental Management by U.S. EPA.

Sections 301, 304, 306 and 307 of the CWA also provide that U.S. EPA must promulgate national effluent limitations guidelines and standards of performance for major industrial categories for three classes of pollutants: (1) conventional pollutants (e.g., Total Suspended Solids, Oil and Grease, Biochemical Oxygen Demand and pH); (2) toxic pollutants (e.g., toxic metals such as Chromium, Lead and Zinc; toxic organic pollutants such as Benzene, Benzo(a)pyrene, Naphthalene and Tetrachloroethylene); and (3) non-conventional pollutants (e.g., Ammonia-N, Fluoride and Phenols (4AAP)).

Six types of effluent limitations guidelines and standards must be promulgated for each major industrial category:

<u>Abbreviation</u>	<u>Effluent Limitation Guideline or Standard</u>
BPT	Best Practicable Control Technology Currently Available
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
NSPS	New Source Performance Standards
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources

The pretreatment standards are applicable to industrial facilities with wastewater discharges to publicly owned treatment works (POTWs) which generally are municipal wastewater treatment plants. The effluent limitations guidelines and new source performance standards are applicable to industrial facilities with direct discharges to navigable waters. Thus, for purposes of the proposed NPDES permit, only the first four types of effluent limitations guidelines and standards are applicable to the USS Gary Works. Section 301 of the CWA, as amended by the Water Quality Act of 1987, requires that BPT effluent limitations were to have been achieved by July 1, 1977. BAT effluent limitations for toxic pollutants, BAT effluent limitations for non-conventional pollutants, and BCT effluent limitations for conventional must be achieved within three years from date of promulgation but no later than March 31, 1989. Section 402(a)(1) of the CWA provides that in the absence of promulgated effluent limitations guidelines or standards, the Administrator, or his designee, may establish effluent limitations for specific dischargers on a case-by-case basis. U.S. EPA regulations provide that these limits may be established using "best professional judgment" (BPJ) taking into account proposed effluent limitations guidelines and standards and other relevant scientific, technical and economic information.

The effluent limitations guidelines and standards applicable to the USS Gary Works are found at 40 CFR Part 420 for cokemaking, sintering, ironmaking, steelmaking, vacuum degassing, continuous casting, hot forming, acid pickling, cold rolling, alkaline cleaning and hot coating operations; and, at 40 CFR Part 433 for the electro-plating operations. 40 CFR Part 420 was promulgated in May 1982, and amended in May 1984. 40 CFR 420 was recently updated with the final revisions to this section signed April 30, 2002, and published in the Federal Register on October 17, 2002. The Byproduct cokemaking effluent limitations in 420.13 and 420.14 were updated in 2002 and now are applicable to this facility. The guidelines were further amended on August 10, 2005 to allow oil and grease trading.

40 CFR Part 433 was promulgated in July 1983 and amended in 1986. The compliance date for achieving the BAT effluent limitations contained in the remaining parts of 40 CFR Parts 420 and 433 was July 1, 1984.

2. Technology-Based Effluent Limitations

Attachment III presents the derivation of the applicable technology-based effluent limitations guidelines and standards for the USS Gary Works for each process wastewater outfall. For each of the basic steelmaking and steel finishing operations, the NPDES production rates developed by USS were used in combination with the BPT, BAT or BCT effluent limitations guidelines or NSPS from 40 CFR Part 420 and 433, as appropriate, to compute the allowable federal technology based discharges of the regulated pollutants.

Following is a brief description of the application of the technology-based effluent limitations guidelines and standards by process operation:

a. Cokemaking

Outfalls 005, 010, and Internal Monitoring Outfalls 501 and 502

For the cokemaking process the characteristic pollutants of cokemaking and by-product recovery operations are the following: ammonia-N, total cyanide, and phenols (4AAP). These are the parameters that the federal effluent guidelines have limited in order to demonstrate compliance with treatment performance. Outfalls 002, 005, 007, and 010 contained discharges from process leaks into non-contact cooling waters and infiltration from contaminated groundwaters and were specifically addressed in the 1990 consent decree. US Steel was required to complete four specific process modifications and remedial actions; conduct an extensive rehabilitation of the sewer systems for Outfalls 002, 005, 007 and 010 to minimize discharges of pollutants from those outfalls; and, to document and continue to implement a wastewater management plan to ensure collection and disposal of process wastewaters. As part of wastewater management plan, Outfall 002 was closed and the wastewater flow diverted to Outfall 005. Outfall 007 has also been closed. Outfalls 002 and 007 have been removed from the permit.

US Steel and IDEM entered into an agreed order on April 3, 1996 relative to air pollution issues pertaining to US Steel's coke facility operations. In addition to the monetary penalty and significant reduction in the discharge of air pollutants to resolve violations of air rules, this agreed order contained additional environmental controls that are being added above and beyond those that are required to meet minimum standards. These additional controls qualified as supplementary environmental projects or SEPs. U.S. Steel was allowed to offset part of its monetary penalty by implementing these SEPs. One such SEP required the use of clean water rather than process wastewater to quench hot coke. Prior to this, US Steel used untreated process wastewater to cool (or quench) the coke after it comes out of the coke ovens. During the quenching process, pollutants in the process wastewater are either volatilized into the air or recirculated through the quench sumps. The SEP required US Steel to use clean water (water taken directly from Lake Michigan) to quench the coke.

US Steel has also installed a treatment system to treat the wastewater that had been used to quench the coke prior to its discharge to the Grand Calumet River through Outfall 005. This process water results from moisture in the coal, by-product recovery process water and coke oven gas condensates. U.S. Steel applied for and received a permit modification to allow the discharge of treated cokemaking and by-product recovery process wastewater (biological treatment) and non-contact cooling water from the coke oven gas desulfurization facility, which was another SEP. Internal Outfall 501 was designated to monitor discharges from the cokemaking and by-product recovery treatment system. Internal Outfall 502 was designated to monitor discharges from the Coke Oven Gas Desulfurization facility and related non-contact cooling water (A review of the data since Internal Outfall 502 was implemented indicates that the separate monitoring for ammonia at Internal Outfall 502 is no longer required). Monitoring for Ammonia at the final outfall (Outfall 005) is still required in the permit.

Descriptions are detailed below:

(1) INTERNAL OUTFALL 501-COKEMAKING AND BY-PRODUCT RECOVERY

Internal Outfall 501 consists of the Coke by-product recovery water which is the collection and reuse of various components of the coke oven gas and flushing liquor. Several types of coke related wastewater are recirculated through the by-products recovery systems. These by-products include coal tars, light crude oil, ammonia, sulfur compounds, naphthalene and phenols. Wastewater is generated from a number of sources within the coke plant. Moisture and volatile components of the coal are generated by the coking process, captured in a collection system and processed through the by-product recovery area. The wastewater treatment system for the cokemaking and by-product recovery wastewater includes oil/tar separation, ammonia stripping, biological treatment and solids settling.

Internal Outfall 501 was established as a point of compliance for the discharge of approximately 1.41 MGD of treated cokemaking and by-product recovery wastewater. Pursuant to the NPDES permit regulations at 40 CFR 122.29(b), US Steel is subject to limits calculated in the 1998 permit modification that were based upon the NSPS promulgated in 1982 for its cokemaking operations. For toxics and non-conventional pollutants, these standards shall apply until the expiration of the applicable time period specified in 40 CFR 122.29(d)(1); thereafter, the source must achieve the effluent limitations specified in 420.13(a). US Steel was subject to the 1982 NSPS standards during a ten-year period beginning on the date of completion of the new source. After such time, the BAT limitations promulgated in 2002 apply to the discharge for toxic and non-conventional pollutants (420.13(a)). The Coke Plant was completed in early 1999, therefore the 10 year limitation expires and the revised BAT limits will become effective upon the effective date of this permit.

Table 1 has been updated to the most recent production data provided by US Steel on April 19, 2007. This data reflects the shut down of the #3 Coke Battery. In addition to the parameters covered under the effluent limitation guidelines, US Steel is required to monitor for Free Cyanide at this outfall. The revised effluent guidelines no longer include Benzene as a parameter of concern, however because USS was granted permission to include coke plant area contaminated groundwater which is high in Benzene, the calculated limits for Benzene based upon the prior NSPS guidelines are held in this permit using Best Professional Judgment.

In addition, when the guidelines were revised certain conditions were included where increased loadings could be included for toxic and non-conventional pollutants. Optimization water which is used in biological treatment facilities were included as part of 40 CFR 420.13(a)(3) as increased loading allocation not to exceed 44.2%, that shall be provided for the portion of the water used for optimization of coke plant biological wastewater treatment systems. The optimization water constitutes approximately 63% of the coke plant influent, therefore the entire allocation of 44.2% is appropriate. US Steel was also given permission to treat the coke plant area contaminated groundwater in the coke plant treatment system. This is approximately 80 gpm of the 262 gpm process waste stream or 30.5%. These additional allocations have been reflected in the Table below. Where the previous NSPS are more stringent than the revised BAT limits, the most stringent is included in the Table below.

The technology-based effluent limitations for Internal Outfall 501 are in Table 1 below:

Table 1
Outfall 501
Technology-Based Effluent Limitations and Standards
40 CFR Part 420.13(a)
Effluent Limitations in lbs/day

Pollutant	Best Available Treatment Technology or 1982 NSPS, whichever is most stringent.	
	30-Day Average (lbs/day)	Daily Maximum (lbs/day)
Total Suspended Solids	706 [@]	1,359 [@]
Oil & Grease	-----	50.4 [@]
Ammonia – N	27.9	40.4
Total Cyanide	27.7 [b]	41.0
Phenols (4AAP)	0.25 [b]	0.50
Benzene	-----	0.25 [@]
Naphthalene	0.09	0.15
Benzo(a)pyrene	0.08	0.15

[@] The updated 40 CFR Part 420.13(a) does not have revised limits for TSS, Oil and Grease, and Benzene. The remaining parameters have more stringent limits than were developed using the 1982 NSPS standards. Therefore, using Best Professional Judgment (BPJ), the limits that would have been assessed for TSS, Oil and Grease, and Benzene using the previous NSPS limits established will remain at Internal Outfall 501. These limits are appropriate and can be met. The benzene limits, although removed from the guideline completely, have been kept because the groundwater being introduced into the Coke Plant is contaminated with Benzene.

TSS and Oil & Grease will be based on the formerly promulgated BPT/BCT limitations (must continue to achieve the standards specified in 40 CFR 420.14, revised as of July 1, 2001 corresponding to the BPT/BCT segment applicable to the US Steel or on the 1982 NSPS for conventional pollutants, whichever is more stringent.

[b] The 1982 NSPS standards were more stringent than the revised BAT and were considered appropriate limits using Best Professional Judgment.

(2) INTERNAL OUTFALL 502 COKE OVEN GAS DESULFURIZATION FACILITY NON-CONTACT COOLING WATER

Internal Outfall 502 consists of the noncontact cooling water discharge generated as a result of the Coke Gas Desulfurization Project SEP in the Air Agreed Order. This desulfurization facility removes the sulfur compounds from coke oven gas and converts them to a marketable sulfur product, resulting in a reduction of 80 percent of the sulfur dioxide emissions from the coke ovens. The discharge resulting from this project was part of the clean water coke quench permit modification of the previous permit.

The coke oven gas desulfurization facility involves a number of chemical reactions that require specific temperatures. Therefore, non-contact cooling water is needed for the heating or cooling of chemical process equipment within the facility. The expected average flow rate through Internal Outfall 502 is approximately 5.23 MGD. The cooling water is supplied by the Gary Works Intake Pump Stations No. 3 & 4 which are located on the boat slip in Gary Harbor off of Lake Michigan. Chemicals are not added to the non-contact cooling water except to treat for zebra mussels at the Lake Michigan water intakes.

There are no specific federal effluent guidelines to cover this type of discharge but Internal Outfall 502 was established to identify potential

cross contamination between the non-contact cooling water system and other process wastewaters. Original monitoring requirements were for flow, ammonia-N and pH.

Technology-based effluent limitations for blast furnace recycle treatment system blowdown are discussed in the next section. The proposed permit contains additional water quality-based effluent limitations for Outfalls 005 and 010.

US Steel has requested that this internal outfall be removed from the permit. A review of the data has not indicated this point as a source of ammonia. Internal Outfall 502 is no longer considered necessary and has been removed from the final permit. The main parameter of concern was ammonia and the continued monitoring of ammonia remains at the final outfall (005).

b. Sinter Plant and Blast Furnaces
Outfalls 010, 015, 017, 018, 019 and 035

US Steel operates a combined treatment and recycle system for gas cleaning and gas cooling water from the blast furnaces. The No. 13 blast furnace has a separate process water recycle system. The sludge from that system is discharged to the combined system and make-up water is taken from the combined system. Gas cleaning water is no longer generated from the Sinter Plant because a dry air pollution control system has been installed for sinter plant air emissions. Blowdown from the blast furnace treatment and recycle system that would have discharged through Internal Outfall 508 and subsequently through Outfall 010 cannot discharge to waters of the State, therefore, Internal Outfall 508 has been deleted from the permit.

The internal outfall had been established in the permit in case discharges from this system were to occur. A discharge has yet to occur and the permittee does not expect it to discharge. In correspondence dated November 26, 2008, US Steel has requested that this internal outfall be removed from the permit. US Steel has not previously discharged from Outfall 508 and no longer requires the permit to contain this internal outfall.

Technology based effluent limitations are not applicable to Outfalls 018, 019 and 035 because process waters are not discharged from these outfalls. Outfall 015 contains non-contact cooling water, stormwater, and the discharge from Internal Outfall 607 (treated landfill leachate, storm water, vacuum truck and truck washing wastewaters). Treatment of the leachate consists of equalization, neutralization, chemical precipitation, and microfiltration. There are no applicable categorical effluent limitations guidelines for these wastewaters. Consequently, any effluent limitations at Outfall 015 would be based on best professional judgment or Water Quality Based Effluent Limits (WQBELs).

- c. Steelmaking, Vacuum Degassing, Continuous Casting, and Hot Forming (160"/210" plate mill) Outfalls 019, 020, 028/030.

USS operates separate recycle systems for the No. 2 Q-BOP and No. 1 BOP gas cooling water systems. Gas cleaning water from both melt shops is treated in thickeners and partially recycled. Blowdowns from both gas cooling water systems are routed to the BOF thickeners.

Intercondenser cooling water for the vacuum de-gasser is treated and recycled at a high rate. The underflow from a clarifier is the only discharge from this system, and is routed to the backwash clarifier from the No. 2 continuous caster.

The No 2 continuous caster is equipped with separate closed cooling systems for mold and machine cooling waters, and a separate treatment system for spray water consisting of a scale pit, pressure filters, backwash clarifier, and cooling tower. The underflow from the backwash clarifier is the only discharge from this system, and is routed to the BOF thickeners. The water systems for the No. 3 continuous caster are similar to those for the No. 2 continuous caster. Spray water for the No. 1 continuous caster is treated on a once-through basis in a scale pit.

Partially treated wastewaters from all of the above operations; wastewaters from the plate and slab mills; a minor amount of non-contact cooling water; and, direct contact slab spray water are collected and pumped to the lagoon tributary to Outfall 030 for final treatment. The lagoon tributary to Outfall 028/030 is the principal treatment device.

BPT and BAT effluent limitations guidelines are applicable to the No. 1 BOP, No. 2 Q-BOP, and the No. 1 continuous caster. BPT and BCT effluent limitations guidelines are applicable to the 160"/210"plate mill. NSPS are applicable to the vacuum degasser and the Nos. 2 and 3 continuous casters.

The NPDES permit limits toxic metals for steelmaking, vacuum degassing, and continuous casting operations at internal Outfall 603. The permit sets effluent limitations based upon federal effluent limitation guidelines for Total Suspended Solids (TSS) and Oil & Grease at the point of discharge (Outfall 028/030). The calculated limits are presented below in Table 3.

Since the time that this permit was public noticed US Steel has transferred the assets pertaining to the 160"/210"plate mill to International Steel Group (ISG). US Steel will continue to treat all process wastewaters from this mill.

In addition, the non-contact cooling waters associated with this facility discharge to Lake Michigan through Outfall 036. ISG received an individual permit issued September 19, 2005 for Outfall 036 to Lake Michigan. Since this is no longer a United State Steel regulated outfall, Outfall 036 has been removed from this permit.

Table 3
Outfall 603
Technology-Based Effluent Limitations and Standards
Effluent Limitations in lbs/day

Pollutant	30-Day Average (lbs/day)	Daily Maximum (lbs/day)
Total Suspended Solids *	2,038	5,933
Oil & Grease *	123.0	687.1
Lead	8.7 [7.92]	26.1 [24.23]
Zinc	13.1 [11.88]	39.1 [36.38]

* Limits for TSS and Oil and Grease are calculated at Outfall 028/030.

The calculated mass limits from the ELG's were retained from the previous permit since they were more stringent due to antibacksliding and antidegradation considerations. The relaxation of effluent limitations from comparable limits in the previous permit is subject to federal and state antibacksliding requirements. In the case of the technology-based effluent limitations calculated from the federal effluent guidelines at Outfall 603, the applicable regulations are the federal antibacksliding provisions of 40 CFR 122.44(l)(1). According to 40 CFR 122.44(l)(1), backsliding is prohibited unless circumstances on which the previous permit were based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under 40 CFR 122.62. Because effluent data indicates that the permittee consistently complies with the technology-based effluent limitations currently at Outfall 603, any increases in production values since the permit was last issued are not considered to be of a material and substantial change in nature. Therefore, the technology-based effluent limitations at Outfall 603 have not been raised to levels calculated based on current production values. Assuming the increase could meet anti-backsliding requirements the increase would have to meet all antidegradation considerations. Treatment for discharges from 603 consists of flocculation, sedimentation, oil removal, and filtration. This internal outfall discharges to the C-Lot Lagoons (Outfalls 028/030) which provides the additional treatment consisting of sedimentation, oil removal, and pH adjustment.

Outfalls 019 and 020 consist of non-contact and non-process type waters and are not covered by any effluent guideline.

- d. Steel Finishing and Electro-plating Operations, Hot Forming (84" hot strip mill) Outfall 034.

USS operates a centralized wastewater treatment facility for steel finishing and electro-plating wastewaters consisting of oil emulsion breaking; dissolved air flotation, separate precipitation of zinc bearing wastewaters from the electro-galvanizing line, pre-treatment of hexavalent chromium from the chromium

plating facilities, and combined sedimentation of all wastewaters for suspended solids and toxic metals removal. The discharge from this facility is limited and monitored at Internal Outfall 604. The combination of BPT and BAT effluent limitations from 40 CFR Parts 420 and 433 are summarized below. As detailed in Attachment IV, the effluent limitations include BPJ effluent limitations for Total Suspended Solids and Oil and Grease for oily wastewaters from the oil cellars at the 84" Hot Strip Mill. The oily wastewaters from the 84" hot strip mill oil cellars are more effectively co-treated with oily wastewaters from finishing operations than in the hot strip mill filtration and recycle system. Effluent limitations except for Total Suspended Solids developed based upon discharges through Outfall 604 were limited at Outfall 034 (see Table 4). It is proposed to move the monitoring except for Oil and Grease back up to Internal Outfall 604 for monitoring and compliance purposes. Effluent limitations for Oil and Grease remain at Outfall 034 (see Table 5). Outfall 034 (discharges from the Final Oil Separator) consist of oil and solids removal.

Effluent limitations for cadmium, nickel, and silver for Outfall 604 are derived from Part 433 (Metal Finishing). Because these metals are not present at significant levels in raw materials used by US Steel, once per quarter monitoring will be proposed.

The BPT/BCT effluent limitations for the 84" hot strip mill are summarized in Table 6 below.

Table 4
Internal Outfall 604
Technology-Based Effluent Limitations applied at Outfall 604
Effluent Limitations (lbs/day)

Pollutant	Technology 30-Day Average (lbs/day)	Technology Daily Maximum (lbs/day)	Water Quality Average (lbs/day)	Water Quality Maximum (lbs/day)
Total Suspended Solids	2,901	6,455	NA	NA
Total Cyanide	10.74	19.83	36,671	88,817
Cadmium	4.3	11.4	2.3	3.4
Chromium	28.25	45.77	74	168
Hexavalent Chromium	0.15	0.46	3.0	6.8
Copper	34.2	55.85	3.8	8.7
Nickel	39.32	65.76	59	100
Silver	3.97	7.10	0.042	0.072
Lead	15.07	35.34	5.9	14
Zinc	33.42	70.00	34	74
Naphthalene	-----	1.68	-----	28
TCE	-----	2.51	-----	2.8
TTO	-----	35.19	-----	-----

Table 5
Outfall 034
Technology-Based Effluent Limitations
Effluent Limitations in lbs/day
Oil and Grease ELG derived from Outfall 604 and 605

Pollutant	30-Day Average (lbs/day)	Daily Maximum (lbs/day)
Oil & Grease	[1,430]	4,555 [3,660]

The previous NPDES permit contained more stringent effluent limitations for the 84" hot strip mill at internal Outfall 605 that were carried over from the then previous permit. Treatment prior to discharge from 605 consists of Sedimentation, oil removal and filtration.

Reduced allocations for Oil & Grease were based upon Best Professional Judgment (BPJ) and are carried into this permit from the last permit.

Table 6
Technology-Based Effluent Limitations and Standards
Internal Outfall 605
Effluent Limitations in lbs/day

Pollutant	30-Day Average (lbs/day)	Daily Maximum (lbs/day)
Total Suspended Solids	5,898.0 [725]	15,741.0 [2,175]
Oil & Grease	-----	3,944.0 [1,450]

- e. Proposed Alternative Effluent Limitation for Oil & Grease - for Outfalls 030 (028/030) and 034.

The effluent guidelines for the Iron and Steel Category 40 CFR 420 were revised and became effective in October 2002. One of the revisions was the removal of the allowance of the Oil and Grease Bubble. This concept allowed for intra-plant transfers of mass pollutant discharges from outfalls where performance is better than required by 40 CFR 420 to outfalls where additional treatment would otherwise be required to comply with Part 420. In order to have made such trades, permittees had to ensure that the overall mass of pollutants discharged will be less than would occur with no trades. For Oil and Grease this was a minimum net reduction of 15% of the amount traded to the other outfall. EPA removed the bubble from the ELG to keep the exchange of different kinds of Oil and Grease from occurring. US Steel appealed this change in the guideline, and as a result of this appeal (70 FR 46459) the Oil and Grease bubble can again be used in this

permit. IDEM has re-established the previously approved bubble with a requested modification by US Steel to reallocate 350 lbs from 034 to 030. Using the same approach as in the previous permit the Oil and Grease bubble has been calculated as follows:

Outfall 605

Proposed Technology Limits	Ave. lbs/day	Maximum lbs/day
	1577	3944
Reduction	-1354	-2494
Limits after Reduction	223	1450
Original Permit Limits	Report	1,450
Final Permit Limits	Report	1,450

Outfall 034

Technology Limits		
Outfall 604	1,207	3,105
Outfall 605 (modified)	223	1,450
BPJ Reduction	----	(895)
Original Permit Limits	1,500	4,000
Total	1,430	3,660

Outfall 030 (028/030)

Technology Limits		
Outfall 603	123	687
Transfer from Outfall 605	1151	2120
Proposed Reduction		
Original Permit Limits	1,302	2,467
Resultant Final Limits	1,274	2,807

The overall quantity of Oil and Grease is the same total at the final outfalls but has just been re-arranged between the two. The final monthly average limits are less than the limits in the previous permit.

Attachment VI contains the treatment flow diagrams for the Coke Plant (Internal Outfall 501) via Outfall 005, Leachate Wastewater Treatment System Internal Outfall 607 via Outfall 015, Internal Outfall 603 and the Terminal Lagoon Nos. 1,2 and 3 to Outfalls 028/030, and the Chrome Treatment/Chrome Reduction and Terminal Plant (Internal Outfall 604) and Hot Strip Mill (Internal Outfall 605) via Outfall 034.

3. Water Quality Based Effluent Limitations

The water quality-based effluent limitations included in the 1994 permit were developed as part of the 1992 Grand Calumet River Wasteload Allocation approved by USEPA in 1993. The 1992 wasteload allocation was based on Indiana water quality standards that became effective in 1990 (new water quality criteria and an upgraded use designation for the Grand Calumet River and Indiana Harbor Ship Canal) and a multi-discharger model that included the Grand Calumet River, Indiana Harbor Ship Canal, Indiana Harbor and portions of Lake Michigan around the Indiana Harbor. Pollutants selected for the multi-discharger model were based on water quality concerns at the time. Specific allocations for CBOD5, ammonia-N, chloride, total chromium, total cyanide, fluoride, lead, zinc, phenols (4AAP) and sulfate were assigned to several U.S. Steel outfalls as part of the wasteload allocation and water quality-based effluent limitations for CBOD5, ammonia-N, total cyanide, lead and zinc were incorporated in the 1994 permit at various outfalls.

New regulations in Indiana governing the development of water quality-based effluent limitations for discharges to waters within the Great Lakes system became effective in 1997. The regulations were developed in accordance with the Water Quality Guidance for the Great Lakes system at 40 CFR Part 132. The regulations included new water quality criteria and methodologies for developing water quality criteria (327 IAC 2-1.5), and procedures for calculating wasteload allocations (WLAs) (5-2-11.4), making reasonable potential to exceed determinations (5-2-11.5) and developing water quality-based effluent limitations (WQBELs) (5-2-11.6). These regulations are applicable to individual pollutants and to whole effluent toxicity. The application of whole effluent toxicity requirements to U.S. Steel is included in a later section. Due to the new regulations, a different approach was warranted in determining the need for and establishing WQBELs in the Grand Calumet River, Indiana Harbor Ship Canal and Indiana Harbor.

U.S. Steel has 12 active outfalls, not consisting entirely of stormwater, that discharge directly to the East Branch Grand Calumet River along a five mile stretch and 4 active outfalls that discharge directly to the open waters of Lake Michigan. In addition to the U.S. Steel outfalls, other significant discharges in the vicinity of U.S. Steel include the Passive Dewatering Facility (PDF) (IN0061077) that discharges through U.S. Steel outfall 032 and the Gary Sanitary District (IN0022977) that discharges downstream of Outfall 034 which is the final U.S. Steel outfall on the East Branch Grand Calumet River. The discharges from the PDF and Gary Sanitary District were taken into consideration in determining the need for and establishing WQBELs for the discharges from U.S. Steel.

The procedures under 5-2-11.4 may be used to establish TMDLs, wasteload allocations in the absence of TMDLs and preliminary wasteload allocations. These procedures apply to the discharges to the East Branch Grand Calumet River and to Lake Michigan. A TMDL has not been completed for any of the Assessment Units for the East Branch Grand Calumet River receiving the discharges from U.S. Steel and a TMDL is not required for any of the pollutants of concern being considered in the reasonable potential analysis except ammonia-N. A TMDL for *E. coli* for the Lake Michigan shoreline has been approved, but *E. coli* is not a pollutant of concern for the reasonable potential analysis and a TMDL is not required for any of the pollutants of concern being considered in the

reasonable potential analysis for discharges to Lake Michigan. Therefore, the procedures under 5-2-11.4 were used to develop preliminary wasteload allocations and wasteload allocations in the absence of a TMDL. Although a TMDL has not been completed for ammonia-N, wasteload allocations for ammonia-N could still be established by setting the allocations equal to the criterion. In addition, since the flow from the U.S. Steel outfalls constitutes the source of dilution flow for the Assessment Units receiving the discharges from U.S. Steel, allocations for some outfalls could be set equal to a value greater than the criterion if an allocation for an upstream outfall was set equal to a value less than the criterion.

Wasteload allocations in the absence of TMDLs are developed to establish water quality-based effluent limitations under 5-2-11.6 and preliminary wasteload allocations are developed to make reasonable potential determinations under 5-2-11.5. The reasonable potential procedures under 5-2-11.5 include provisions for making reasonable potential determinations using best professional judgment (5-2-11.5(a)) and using a statistical procedure (5-2-11.5(b)). The statistical procedure is a screening process in which a projected effluent quality (PEQ) based on effluent data is calculated and compared to a preliminary effluent limitation (PEL) based on the preliminary wasteload allocation. Both the best professional judgment and statistical procedures were used to establish the need for water quality-based effluent limitations to protect the designated uses of the Grand Calumet River and downstream waters.

A separate provision for making reasonable potential determinations for discharges consisting solely of once-through noncontact cooling water (NCCW) is included under 5-2-11.5(g). This provision may also be applied to discharges consisting of mixed wastestreams (e.g. NCCW, stormwater and process wastewater) if each component is considered separately. The discharges from several U.S. Steel outfalls consist of mixed wastestreams. While IDEM is placing special conditions on the stormwater component, the outfalls with available pollutant data include sources of wastewater besides NCCW and stormwater. Information was not available to determine reasonable potential for the individual sources of wastewater. Therefore, this provision was not applied to any of the U.S. Steel outfalls.

To conduct reasonable potential to exceed analyses, IDEM utilized the following effluent data collected and submitted by U.S. Steel: data collected during the period January 2005 through April 2008 in accordance with the current permit and reported on monthly monitoring reports (MMRs); data collected in 1999 and 2000 as part of the Grand Calumet River TMDL study, data collected during a six week period in 1998 as part of a condition in the 1994 permit; data collected for the 1999 permit renewal application in addition to the six week monitoring data; and, data collected subsequent to the 1999 permit renewal application in support of the permit renewal.

To develop wasteload allocations, IDEM utilized the following sources of water quality data for the East Branch Grand Calumet River: IDEM fixed water quality monitoring station GCR-42 on Bridge Street (upstream of Outfall 034); IDEM fixed station GCR-37 on Kennedy Avenue (upstream of the confluence of East Branch and West Branch Grand Calumet River); data collected within the U.S. Steel discharge reach and downstream of U.S. Steel in 1999 and 2000 as part of the Grand Calumet River TMDL study; and, data

collected by U.S. Steel at Broadway Avenue and the Pennsylvania Railroad Bridge during their six week monitoring period in 1998. IDEM utilized the following sources of water quality data for Lake Michigan: IDEM fixed station LM-G at the public water supply intake for the City of Gary; IDEM fixed station LM-DSP at Dunes State Park; and, data collected by U.S. Steel at their water intakes and included in the 1999 permit renewal application.

After a review of effluent and instream data, it was decided to conduct a multi-discharger WLA for ammonia-N, chloride, fluoride, copper, lead and zinc. Other pollutants of concern, including free cyanide, were considered on an outfall by outfall basis. The 1992 WLA included total cyanide, but aquatic life criteria for cyanide are now expressed in the form of free cyanide. Site-specific water quality criteria for free cyanide that apply to East Branch Grand Calumet River from Outfall 005 to a point one mile downstream are included in 2-1.5-16(g), Table 16-1 and were approved by US EPA October 3, 2005. The one mile segment includes Outfalls 005, 010 and 015. The site-specific criteria consist of two sets of acute and chronic aquatic life criteria. One set applies to periods when adult salmonids are present and the other to periods when salmonids are absent. A review of effluent and instream data for free cyanide did not show a need for a multi-discharger WLA for free cyanide. However, a reasonable potential analysis for free cyanide was conducted for Outfalls 005 and 010. Further information about the site-specific criteria for free cyanide is provided in the explanation of proposed effluent limitations for Outfalls 005 and 010.

The 1992 multi-discharger model divided the East Branch Grand Calumet River into twenty complete mix segments. The U.S. Steel outfalls are located in the first ten segments. The 1992 model applied the final acute value (FAV) to individual outfalls and chronic criteria to the end of each segment. The procedures in 5-2-11.4 require the FAV to be applied to individual outfalls, but also limit the dilution available for each outfall (the mixing zone) to one-quarter of the stream design flow. Because of the potential for overlapping mixing zones within a segment, the combined discharges in a segment were also limited collectively to one-quarter of the stream design flow. This was done in accordance with 5-2-11.4(b)(3)(D) which requires the combined effect of overlapping mixing zones to be evaluated to ensure that applicable criteria and values are met in the area where the mixing zones overlap.

Based on the reasonable potential statistical procedure at 5-2-11.5(b)(1)(iii) and (iv), the procedures under 5-2-11.4(c) are used as the basis for determining preliminary WLAs and the preliminary WLAs are then used to develop monthly and daily PELs in accordance with the procedure for converting WLAs into WQBELs under 5-2-11.6. Two critical inputs to the procedure under 5-2-11.4(c) include the background concentration and the effluent flow. The background concentration is determined under 5-2-11.4(a)(8). Under this rule, background concentrations can be determined using actual instream data or instream concentrations estimated using actual or projected pollutant loading data. All three were used in this analysis depending on the pollutant and the location of the outfall with respect to available data. In the 1992 WLA, the flow assigned to each outfall was the long-term average flow. Except in the development of WQBELs for Outfall 005 as noted below, this was continued in the current analysis using data from January 2006 through December 2007.

For those pollutants of concern not included in the multi-discharger WLA, PELs for each applicable outfall were calculated using an outfall specific Excel spreadsheet that calculates PELs using the procedures under 5-2-11.4(c) to calculate WLAs and the procedures under 5-2-11.6 to convert WLAs into PELs. The spreadsheet considers all water quality criteria (acute and chronic aquatic life, human health and wildlife) and associated stream design flows and mixing zones. For mercury, which is a bioaccumulative chemical of concern (BCC), a mixing zone was not allowed in the development of PELs for any outfall in accordance with 5-2-11.4(b)(1). For those pollutants included in a multi-discharger WLA, an additional multi-discharger Excel spreadsheet was used to ensure that the most stringent water quality criterion is met at the edge of the mixing zone for each segment. This was the 4-day average chronic criterion except for zinc in which it was the one-hour average acute criterion. In this spreadsheet, the preliminary WLA was included as an input and PELs were calculated from the preliminary WLA.

In the multi-discharger spreadsheet, preliminary WLAs for each outfall were established, if possible, so that the monthly and daily PEQs did not exceed the PELs calculated from the preliminary WLAs. Otherwise, the preliminary WLAs were adjusted as necessary so that the calculated PELs did not exceed the PELs calculated using the outfall specific spreadsheets and so that the water quality criterion was not exceeded at the edge of the mixing zone for each segment as determined using the multi-discharger spreadsheet. For some outfalls, the discharge of one or more pollutants for which a multi-discharger WLA was conducted was not considered significant, so a preliminary WLA was established based on the reported effluent concentration, but PELs were not calculated as allowed under 5-2-11.5(b)(1).

After assigning a preliminary WLA to each outfall in a segment and entering the WLA into the multi-discharger spreadsheet, the spreadsheet calculates the PELs for each outfall, the concentration at the edge of the mixing zone for the segment and the concentration at the end of each segment after complete mixing. The concentration after complete mixing then becomes the background concentration for the next segment. To calculate PELs using the outfall specific spreadsheets, the background concentration for each outfall was calculated assuming complete mixing between outfalls. This was done by entering the WLAs for each outfall into a separate spreadsheet that calculated the background concentration upstream of each outfall. By conducting a multi-discharger WLA in this manner, the background concentration for each outfall was based on the accumulated WLAs for the prior outfalls. Since the WLAs were based in some cases on projected effluent quality, the background concentrations were based on projected loading data. This provided a conservative means of determining the cumulative impact of the outfalls. For those pollutants not included in a multi-discharger WLA, the background concentration for each outfall was based on instream data, actual pollutant loading data or projected pollutant loading data.

A provision is included in 5-2-11.4(a)(4) to protect against additive effects possibly associated with simultaneous multiple chemical human exposure to carcinogens. The procedure is used to adjust wasteload allocations if a discharge contains more than one substance for which human cancer criteria or values are available or can be calculated.

The procedure was applied to benzene and benzo(a)pyrene in Outfalls 005 and 010 based on data showing the presence of both substances in the discharges from these outfalls. The procedure was also applied to benzo(a)pyrene and tetrachloroethylene in Outfall 034 based on data showing the presence of benzo(a)pyrene in the discharge and data showing the presence of tetrachloroethylene in internal Outfall 604. For Outfalls 005 and 010, the percentage of benzene was adjusted downward until PEQs were just less than PELs. For Outfall 034, the percentage of tetrachloroethylene was adjusted downward until the PELs were just greater than the mass limits at internal Outfall 604. In each case the percentage given to benzo(a)pyrene was such that the sum of the percentages of the two carcinogens equaled one hundred.

Reasonable potential determinations for metals are made by default using effluent data collected in the form of total recoverable metal. However, a provision is included in 5-2-11.5(b)(1)(D) for making reasonable potential determinations for metals based on effluent data in the form of dissolved metal if specific conditions are satisfied, including: the metal in the effluent does not become more dissolved outside the mixing zone; instream data are available to determine the hardness of the receiving stream and a reasonable potential analysis using effluent data in the form of total recoverable metal and water quality criteria based on total recoverable metal (e.g. human health criteria) shows that WQBELs are not required.

The facility collected effluent data in the form of dissolved metal in addition to total recoverable metal during the six-week monitoring period and the TMDL study. However, for all of the pollutants of concern, except copper, the reasonable potential analysis was done using effluent data in the form of total recoverable metal. For copper, the default analysis showed reasonable potential at several outfalls. Therefore, U.S. Steel requested that IDEM conduct the reasonable potential analysis using effluent data in the form of dissolved metal. IDEM granted this request for Outfalls 005, 010, 015, 018, 019, 020 and 028/030 based on the following: a review of fixed station data (GCR-42 and GCR-37) did not show significant reductions in pH or an increase in dissolved copper downstream; instream hardness data are available from fixed station GCR-42 and were used in the analysis; and, the PEQs calculated using effluent data in the form of total recoverable metal did not exceed PELs based on human health criteria. However, IDEM did not grant this request for Outfall 034 due to concerns with the effluent data collected in the form of dissolved metal.

The results of the reasonable potential statistical procedure are included in Tables 1-11 of Attachment IV. Based on a review of available effluent data, the reasonable potential statistical procedure was not conducted for any pollutants at Outfalls 021, 023, 032, 033 and 039 as allowed under 5-2-11.5(b)(1). However, the discharges from Outfalls 021, 023, 032 and 033 were considered in the multi-discharger WLA. For the pollutants for which a multi-discharger WLA was conducted, the results show that none of the discharges has a reasonable potential to exceed a water quality criterion for any of the pollutants. The results do show the need for WQBELs for pollutants considered on an individual outfall basis such as free cyanide and benzo(a)pyrene at Outfalls 005 and 010 and mercury at multiple outfalls. Even though the results did not show reasonable potential for ammonia-N at any outfall, monitoring for ammonia-N is being included at all outfalls discharging to the East Branch Grand Calumet River due to the 303(d) listing

for ammonia-N, instream data at Tennessee Street and Virginia Street showing impairment for ammonia-N and instream data at fixed station GCR-42 showing ammonia-N concentrations near the chronic aquatic life criterion.

In addition to establishing WQBELs based on the reasonable potential statistical procedure, IDEM is also required to establish WQBELs under 5-2-11.5(a) "If the commissioner determines that a pollutant or pollutant parameter (either conventional, nonconventional, a toxic substance, or whole effluent toxicity (WET)) is or may be discharged into the Great Lakes system at a level that will cause, have the reasonable potential to cause, or contribute to an excursion above any applicable narrative criterion or numeric water quality criterion or value under 327 IAC 2-1.5". Chlorine is added to the intake water for zebra mussel control at concentrations exceeding water quality criteria. Therefore, chlorine may be discharged at a level that will cause an excursion above the numeric water quality criterion for total residual chlorine under 2-1.5 and WQBELs for total residual chlorine are required at outfalls receiving noncontact cooling water. Effluent limitations for selenium were included for Outfall 005 in the 1998 permit modification based on a reasonable potential analysis. For this permit renewal, the reasonable potential statistical procedure was conducted using data collected over the last three years. The results show that the effluent concentrations have decreased to the point where there is no reasonable potential based on the statistical procedure. However, considering that monitoring data for internal Outfall 501 show that it is a source of selenium at a concentration well above the chronic criterion, that selenium is diluted with variable cooling water flow prior to discharge through Outfall 005, and that Outfall 005 receives no upstream dilution flow, selenium may be discharged at a level that will cause an excursion above the numeric water quality criterion for selenium under 2-1.5 and WQBELs for selenium at Outfall 005 are required.

For each pollutant receiving technology-based effluent limits (TBELs) at an internal outfall, and for which water quality criteria or values exist or can be developed, concentration and corresponding mass-based WQBELs were calculated at the final outfall. This was done for Outfall 005 (benzo(a)pyrene, naphthalene, ammonia-N and Total Cyanide at internal Outfall 501), Outfall 028/030 (lead and zinc at internal Outfall 603) and Outfall 034 (cadmium, hexavalent chromium, total chromium, copper, lead, nickel, silver, zinc, naphthalene, tetrachloroethylene and Total Cyanide at internal Outfall 604). The mass-based WQBELs at the final outfall were compared to the mass-based TBELs at the internal outfall. Since the facility is authorized to discharge up to the mass-based TBELs, if the mass-based TBELs at the internal outfall exceed the mass-based WQBELs at the final outfall, the pollutant may be discharged at a level that will cause an excursion above a numeric water quality criterion or value under 2-1.5 and WQBELs are required for the pollutant at the final outfall. This was the case for lead at Outfall 028/030 and cadmium, copper, lead, and silver at Outfall 034. Therefore, WQBELs are required for these pollutants regardless of the results of the reasonable potential statistical procedure. However, the results of the reasonable potential statistical procedure were used to help establish the monitoring frequency. Because of changes to the cyanide criterion adopted in 1997, WQBELs can be developed for Free and Total Cyanide. The more toxic version is Free and limits have been incorporated at both Outfalls 005 and 010 based upon reasonable potential. The levels of Total Cyanide do not exhibit reasonable potential. The limit for Lead at Outfall 034 is the same as the limit in the previous permit

and cannot be raised to the current calculated water quality based effluent limits due to Anti-backsliding. The mass limit calculated for Total Cyanide at 604 is due to the parameter being in the guideline and is not expected to be in the discharge. USS currently does not use any cyanide plating solutions in any metal finishing operations.

Once a determination is made using the reasonable potential provisions under 5-2-11.5 that WQBELs must be included in the permit, the WQBELs are calculated in accordance with 5-2-11.5(d). Under this provision, in the absence of an EPA-approved TMDL, WLAs are calculated for the protection of acute and chronic aquatic life, wildlife, and human health in accordance with the WLA provisions under 5-2-11.4. The WLAs are then converted into WQBELs in accordance with the WQBEL provisions under 5-2-11.6. In accordance with 5-2-11.5(e), IDEM may still include monitoring requirements for a pollutant in the permit if the reasonable potential analysis does not show the need for WQBELs for the pollutant.

In the calculation of WLAs for the purposes of developing WQBELs, the background concentrations were based, in order of preference, on the following: instream monitoring data; actual pollutant loading data; or, projected pollutant loading data determined using the wasteload allocations developed for upstream outfalls. Except for Outfall 005 and the combined Outfall 005/010, the long-term average effluent flow was used in the calculation of WLAs for the purposes of developing WQBELs just as it was in the calculation of WLAs for the purposes of developing PELs. For Outfall 005, the maximum monthly average flow reported for each outfall during the period January 2006 through December 2007 was used in the calculation of WLAs for the purposes of developing WQBELs, as allowed under 5-2-11.4(a)(9). For the combined Outfall 005/010, the maximum monthly average flow for Outfall 005 and the long-term average flow for Outfall 010 were used. Since these two outfalls receive no upstream dilution flow, the concentration-based WLAs and WQBELs do not change with the use of the higher effluent flow. However, the mass-based WQBELs calculated from the concentration-based WQBELs do increase. Since the concentration-based WQBELs do not change, the use of the higher effluent flow does not affect the background concentrations used to develop WLAs for downstream outfalls. The WQBELs are included in Tables 13-15 of Attachment IV.

Whole Effluent Toxicity Requirements

The 1994 permit required U.S. Steel to conduct whole effluent toxicity (WET) testing quarterly for two years at Outfalls 005, 010, 028/30 and 034. Additional data at Outfalls 005 and 010 were collected as part of subsequent permit modifications. The additional data for Outfall 005 were collected after a new treatment process was started at internal Outfall 501 and made the prior WET data no longer representative. U.S. Steel also collected WET data for Outfalls 010 and 028/030 in 2008 in support of the permit renewal.

The 1997 Indiana Great Lakes regulations included narrative criteria with numeric interpretations for acute (2-1.5-8(b)(1)(E)(ii)) and chronic (2-1.5-8(b)(2)(A)(iv)) WET and a procedure for conducting reasonable potential for WET (5-2-11.5(c)(1)). US EPA did not approve the reasonable potential procedure for WET so Indiana is now required

under 40 CFR Part 132.6(c) to use the reasonable potential procedure in Paragraphs C.1 and D of Procedure 6 in Appendix F of 40 CFR Part 132. IDEM used this procedure in conducting the reasonable potential analysis for WET except that the equation was rearranged so that it is similar to the equation that IDEM uses for other pollutants and pollutant parameters.

The results of the reasonable potential analysis are shown in Table 12 of Attachment IV. The results show that the discharges from Outfalls 005 and 034 have a reasonable potential to exceed the numeric interpretation of the narrative criterion for chronic WET. Once a determination is made that WQBELs are required for WET, the WQBELs are established in accordance with 327 IAC 5-2-11.6(d). This provision allows a case-by-case determination of whether to establish a WQBEL for only acute or chronic WET, or WQBELs for both acute and chronic WET, the number of species required for testing and the particular species required for testing.

It was decided to establish WQBELs for only chronic WET at Outfalls 005 and 034 and to require testing for both Ceriodaphnia dubia and Fathead Minnow. The WQBELs were established as monthly average limits and set equal to the chronic wasteload allocation in accordance with 5-2-11.6(d)(1)(E). The WQBELs are noted in the permit in Part I.L, Biomonitoring Requirements and are included in Attachment IV Tables 12, 13 and 15 of the Fact Sheet.

In addition to the WQBELs for chronic WET at Outfalls 005 and 034, additional requirements for WET apply to Outfalls 005, 010, 030 and 034. For each of these outfalls, the facility is required to conduct chronic toxicity testing for both Ceriodaphnia dubia and Fathead Minnow once a month for three months and thereafter quarterly for the duration of the permit using the most sensitive of the two species. Acute toxicity is to be derived from the chronic tests and reported in addition to the chronic toxicity. Toxicity is to be reported in terms of acute and chronic toxic units and compared to calculated toxicity reduction evaluation (TRE) triggers. The TRE triggers are set equal to the acute and chronic WLAs for WET. If either an acute or chronic TRE trigger is exceeded, another chronic WET test must be conducted within two weeks. If the results of any two consecutive tests exceed the applicable TRE trigger, U.S. Steel must conduct a TRE. For each outfall, after the completion of three toxicity tests that do not exceed the acute and chronic TRE triggers, U.S. Steel may reduce the number of species tested to only include the most sensitive to the toxicity in the effluent.

Antidegradation

New regulations in Indiana governing implementation of antidegradation for discharges to waters within the Great Lakes system became effective in 1997. The regulations were developed in accordance with the Water Quality Guidance for the Great Lakes system at 40 CFR Part 132. The regulations included an antidegradation policy (327 IAC 2-1.5-4), antidegradation implementation procedures for High Quality Waters that are not Outstanding State Resource Waters (OSRWs) (327 IAC 5-2-11.3(b)) and antidegradation implementation procedures for OSRWs (327 IAC 5-2-11.7). The implementation procedures for High Quality Waters and OSRWs distinguish between pollutants that are bioaccumulative chemicals of concern (BCCs) and pollutants that are not BCCs. For

waters that are not considered High Quality Waters, the regulations do not allow a lowering of water quality (327 IAC 5-2-11.3(a)).

The Indiana portion of the open waters of Lake Michigan is designated in 327 IAC 2-1.5-19(b)(2) as an OSRW. Therefore, the U.S. Steel discharges to Lake Michigan are subject to the antidegradation implementation procedures for OSRWs in 327 IAC 5-2-11.7. The antidegradation implementation procedures for OSRWs include provisions for discharges to tributaries of OSRWs in 327 IAC 5-2-11.7(a)(2). Since the Grand Calumet River is a tributary to Lake Michigan, the U.S. Steel discharges to the Grand Calumet River are subject to the antidegradation implementation procedures in 327 IAC 5-2-11.7(a)(2) in addition to those in 327 IAC 5-2-11.3. The procedures in 327 IAC 5-2-11.7(a)(2) are supplemented by Non-Rule Policy Document Water-002-NPD, "Antidegradation Requirements for Outstanding State Resource Waters Inside the Great Lakes Basin."

The Grand Calumet River is considered a High Quality Water for all of the pollutants limited in the U.S. Steel permit except Ammonia (Assessment Units INK0346_01, INK0346_02, and INK0346_03 and Oil and Grease since it is included on the 2008 303(d) List and is proposed to be included on the 2010 303(d) List for these parameters. Lake Michigan is considered a High Quality Water for all of the pollutants limited in the U.S. Steel permit except mercury since it is included on the 2008 303(d) and is proposed to be included on the 2010 303(d) List for mercury in fish tissue. Mercury is only limited in the U.S. Steel permit at outfalls that discharge to the Grand Calumet River. Mercury is also the only pollutant of concern in the U.S. Steel permit that is a BCC.

After the effluent limitations were established for the proposed permit, a review was done to determine if the permit satisfies the antidegradation requirements in 327 IAC 5-2-11.3 and 327 IAC 5-2-11.7. The Grand Calumet River is not a High Quality Water for Ammonia (Assessment Units INK0346_01, INK0346_02, and INK0346_03 and Oil and Grease, so discharges of Ammonia and Oil and Grease are not allowed to cause a lowering of water quality in accordance with 327 IAC 5-2-11.3(a). The Grand Calumet River is a High Quality Water for the other pollutants of concern in the U.S. Steel permit so in accordance with 327 IAC 5-2-11.3(b), for High Quality Waters that are not designated as an OSRW, no action resulting in a significant lowering of water quality can occur unless an antidegradation demonstration has been completed and approved. Since the Grand Calumet River is a tributary of an OSRW, in accordance with 327 IAC 5-2-11.7(a)(2)(B), the discharge shall not cause a significant lowering of water quality in the OSRW. If a discharge to a tributary of an OSRW causes a significant lowering of water quality in the OSRW, it would not be allowed, regardless of an approvable antidegradation demonstration under 327 IAC 5-2-11.3.

According to 327 IAC 5-2-11.3(b)(1)(A), a significant lowering of water quality occurs if there is a new or increased loading of a BCC from a point source for which a new permit or permit modification would be required. According to 327 IAC 5-2-11.3(b)(1)(B), a significant lowering of water quality occurs if there is a new or increased permit limit for a non-BCC from a point source and the new or increased permit limit will result in both of the following:

- (i) A calculated increase in the concentration of the substance outside of the mixing zone, and;
- (ii) A lowering of water quality that is greater than a de minimis lowering of water quality.

According to 327 IAC 5-2-11.7(a)(2), for a new or increased discharge of a pollutant or pollutant parameter from a new or existing Great Lakes discharger into a tributary of an OSRW for which a new or increased permit limit would be required, the following apply:

- (1) 327 IAC 5-2-11.3(a) and 327 IAC 5-2-11.3(b) apply to the new or increased discharge; and
- (2) the discharge shall not cause a significant lowering of water quality in the OSRW.

According to nonrule policy document Water-002-NPD, a new or increased discharge into a tributary of Lake Michigan will not cause a significant lowering of water quality in Lake Michigan if any of several provisions are met, including the following:

The new or increased discharge into a tributary of Lake Michigan does not cause a significant lowering of water quality in the tributary, as determined under 327 IAC 5-2-11.3(b)(1)(A) or 327 IAC 5-2-11.3(b)(1)(B).

In addition to the antidegradation provisions in 327 IAC 5-2-11.3(b)(1)(A) and 327 IAC 5-2-11.3(b)(1)(B), exemptions and exceptions to antidegradation apply in 327 IAC 5-2-11.3(b)(1)(C). For example, in accordance with 5-2-11.3(b)(1)(C)(ii), the following does not constitute a significant lowering of water quality:

New limits for an existing permitted discharger that are not a result of changes in pollutant loading, and will not allow an increase in pollutant loading, including new limits that are a result of the following:

- (AA) New or improved monitoring data.
- (BB) New or improved analytical methods.
- (CC) New or modified water quality criteria or values.
- (DD) New or modified effluent limitations guidelines, pretreatment standards, or control requirements for POTWs.

Similarly, in addition to the antidegradation implementation provisions in 327 IAC 5-2-11.7(a)(2)(A) and 327 IAC 5-2-11.7(a)(2)(B), exemptions and exceptions apply in 327 IAC 5-2-11.7(a)(2)(C). For example, in accordance with 327 IAC 5-2-11.7(a)(2)(C)(i), the requirements of 327 IAC 5-2-11.7(a)(2) will be considered to have been met when one or more of the items listed in 327 IAC 5-2-11.3(b)(1)(C)(ii) apply.

The antidegradation procedures used in this review apply to point source discharges. The definition of “point source” in 327 IAC 5-1.5-40 applies to the discharge of a pollutant and the definition of “discharge of a pollutant” in 327 IAC 5-1.5-11 includes discharges

through pipes that do not lead to treatment works. Therefore, the antidegradation procedures were applied to all final outfalls and to internal outfalls that do not lead to treatment works. This includes Internal Outfalls 501 and 607. Internal Outfall 603 passes through a terminal lagoon prior to discharge through Outfall 028/030 and Internal Outfalls 604, 605 and 606 pass through an oil water separator prior to discharge through Outfall 034. Therefore, internal outfalls 603, 604, 605 and 606 are not considered point source discharges subject to the antidegradation implementation procedures. However, for information purposes, they were included in the antidegradation review.

The 1994 permit has been modified several times making it difficult to piece together the existing applicable effluent limitations that apply to each outfall. In addition, several individual outfalls and two bubbled outfalls (200 and 400) have been removed in the proposed permit. Therefore, Table 16 (parts 1-6) in Attachment IV was developed to compare the existing effective limitations to the proposed limitations for each of the remaining outfalls. If the permit authorizes a new or increased loading of a BCC (mercury) or new or increased limits for non-BCCs, further analysis was required to determine if the discharge would cause a significant lowering of water quality under 327 IAC 5-2-11.3 or a significant lowering of water quality in the OSRW under 327 IAC 5-2-11.7(a)(2)(B).

The first set of footnotes at the end of Table 16-6 explain those situations where an apparent increase in a permit limit at an outfall is actually due to a change in the way the limits are being applied in the proposed permit as compared to the current permit. For example, with the elimination of Outfall 200 (combined Outfalls 005 and 010), effluent limitations are now applied directly to Outfalls 005 and 010 whereas in the current permit only monitoring applies to the individual outfalls. To determine if there are new or increased limits at Outfalls 005 and 010, the limits at the two outfalls in the proposed permit were combined and then compared to the limits at Outfall 200 in the current permit. This comparison was done in Side Table A of Table 16-1. In addition, with the proposed redirection of Outfall 010 to Outfall 005 after the issuance of the permit, the final Outfall 005 (including 010) was compared to the combination of limits at the individual outfalls that will be effective after the issuance of the permit. This comparison was done in Side Table B of Table 16-2. A second example is the change in the point of application of technology-based effluent limitations from the final outfall in the current permit to an internal outfall in the proposed permit (e.g. mass limits for total chromium being moved from Outfall 034 to internal Outfall 604). A third example is the allowance under the Federal Effluent Limitations Guidelines for U.S. Steel to request that technology-based effluent limitations for Oil and Grease be transferred from one outfall to another (Bubbled). This occurred for Outfalls 028/030 and 034 in which the proposed daily maximum mass limit at Outfall 028/030 was increased, but the daily maximum mass limit at Outfall 034 was equally decreased. While antidegradation is typically applied on an outfall by outfall basis, since outfall trading for Oil and Grease is allowed under Federal Regulation for developing technology-based effluent limitations (TBELs), it was allowed under antidegradation since the outfalls are to the same stretch of the Grand Calumet River. Therefore, the proposed daily maximum mass limit at Outfall 028/030 is not considered an increased limit for antidegradation purposes.

The second set of footnotes at the end of Table 16 provide an explanation of whether the new or increased loading for a BCC (mercury) or new or increased permit limits for non-BCCs would cause a significant lowering of water quality under 327 IAC 5-2-11.3(b) or a significant lowering of water quality in the OSRW under 327 IAC 5-2-11.7(a)(2)(B). The following are a few examples of the results of the antidegradation review in Table 16.

Since the Grand Calumet River is not a High Quality Water for Oil and Grease, antidegradation for discharges of Oil and Grease to the Grand Calumet River was implemented under 327 IAC 5-2-11.3(a). This provision does not allow a lowering of water quality for the pollutant. Only outfall 028/030 authorizes an increase in the discharge of Oil and Grease. Outfall 028/030 contains an increased daily maximum mass limit for Oil and Grease whereas Outfall 034 contains a comparable decrease in the daily maximum mass limit for Oil and Grease due to outfall trading allowed under Federal Regulation. Since there is no overall increase in mass of Oil and Grease discharged, there is no lowering of water quality and antidegradation under 327 IAC 5-2-11.3(a) is satisfied. The Oil and Grease limits for Outfalls 028/030 and 034 are bubbled so there is actually no increase in permit limits. Therefore, antidegradation for tributaries to OSRWs under 327 IAC 5-2-11.7(a)(2) does not apply.

New limits for mercury are required at Outfalls 005, 010, 015, 018, 019, 020, 028/030, and 034 based on a reasonable potential analysis using data collected in 1999 and 2001. Since the permit was last renewed in 1994, more stringent water quality criteria for mercury have become effective and a new analytical method has become available that allows mercury in the discharge to be quantified. The new limits for mercury are a result of the following items in the antidegradation exemption in 327 IAC 5-2-11.3(b)(1)(C)(ii):

- (AA) New or improved monitoring data.
- (BB) New or improved analytical methods.
- (CC) New or modified water quality criteria or values.

The new limits for mercury are not a result of changes in pollutant loading and will not allow an increase in pollutant loading since the projected effluent quality is greater than the proposed effluent limits and the existing discharge flow was used to calculate the proposed mass limits. Therefore, the new limits for mercury do not cause a significant lowering of water quality for mercury and antidegradation under 327 IAC 5-2-11.3(b) is satisfied. Since this same exemption applies to 327 IAC 5-2-11.7(a)(2), the new limits for mercury do not cause a significant lowering of water quality in the OSRW.

New mass limits for total residual chlorine are required at most outfalls. The current permit only has concentration limits at these outfalls and they are less stringent than the proposed concentration limits. The existing effluent flow was used to calculate the WQBELs for the proposed permit so the new mass limits will not result in a calculated concentration increase outside of the mixing zone under 327 IAC 5-2-11.3(b)(1)(B)(i). Therefore, the new mass limits will not cause a significant lowering of water quality and antidegradation under 327 IAC 5-2-11.3(b) is satisfied. Since the new limits do not cause a significant lowering of water quality under 327 IAC 5-2-11.3(b)(1)(B), they do not

cause a significant lowering of water quality in the OSRW in accordance with Non-Rule Policy Document Water-002-NPD.

The proposed permit contains increased mass limits for free cyanide at Outfalls 005 and 010 prior to the redirection of Outfall 010 to Outfall 005 and increased mass limits for free cyanide and selenium at Outfall 005 after the redirection of Outfall 010. The stream design flow upstream of Outfall 005 is zero and the concentration limits in each scenario are not changing. The increased mass limits are a result of an increase in flow and will not result in a calculated concentration increase outside of the mixing zone under 327 IAC 5-2-11.3(b)(1)(B)(i). Therefore, the increased mass limits will not cause a significant lowering of water quality and antidegradation under 327 IAC 5-2-11.3(b) is satisfied. Since the increased limits do not cause a significant lowering of water quality under 327 IAC 5-2-11.3(b)(1)(B), they do not cause a significant lowering of water quality in the OSRW in accordance with Non-Rule Policy Document Water-002-NPD.

New WQBELs for cadmium, copper and silver are required at Outfall 034 as a result of the new application of TBELs at Internal Outfall 604. The TBELs were authorized under the current permit, but were not applied. The same flow (1.98 mgd) was used to calculate the TBELs for the proposed permit as would have been used in the current permit, so the new TBELs do not allow an increase above what was authorized, but not applied in the current permit. The mass-based WQBELs at Outfall 034 are more stringent than the TBELs so they do not allow an increase above the TBELs. The new TBELs are a new application of Federal Effluent Limitations Guidelines and fall under the antidegradation exemption in 327 IAC 5-2-11.3(b)(1)(C)(ii)(DD) so they do not cause a significant lowering of water quality and antidegradation under 327 IAC 5-2-11.3(b) is satisfied. This exemption also applies to 327 IAC 5-2-11.7(a)(2) so the new limits do not cause a significant lowering of water quality in the OSRW. Since the mass-based WQBELs at Outfall 034 are more stringent than the TBELs at Internal Outfall 604, a report only requirement is included at internal Outfall 604 instead of actual TBELs.

New mass limits for total residual chlorine are required at Outfalls 035, 037, 039, 041A and 041B. These outfalls discharge directly to Lake Michigan which is an OSRW. Therefore, antidegradation under 327 IAC 5-2-11.7 was applied to these outfalls. The current permit has concentration limits for total residual chlorine that are less stringent than the concentration-based WQBELs in the proposed permit. The existing effluent flow determined under 327 IAC 5-2-11.4(a)(9) was used to calculate the WQBELs for the proposed permit. The new mass limits are more stringent than those that would be calculated for the current permit under 327 IAC 5-2-11.7(a)(1)(B). Therefore, the new mass limits are not considered an increased discharge under 327 IAC 5-2-11.7(a)(1)(B) and antidegradation under 327 IAC 5-2-11.7 is satisfied.

A complete antidegradation review of the proposed U.S. Steel permit is included in Table 16. Based on the antidegradation review, the Department has determined that the proposed permit complies with the antidegradation policy found in 327 IAC 2-1.5-4 and an antidegradation demonstration is not required.

The permittee is prohibited from undertaking any deliberate action that would result in a new or increased discharge of a BCC or a new or increased permit limit for a pollutant or

pollutant parameter that is not a BCC unless one (1) of the following is completed prior to the commencement of the action; (i) Information is submitted to the commissioner demonstrating that the proposed new or increased discharge will not cause a significant lowering of water quality; (ii) An antidegradation demonstration submitted and approved in accordance with 327 IAC 5-2-11.3.

4. Proposed Effluent Limitations by Outfall

Limits are derived by a comparison of the limits from the previous permit, the calculated federal effluent limitation guideline (ELGs), and the water quality based effluent limitations of which the most stringent is placed in the permit.

Outfalls 005 and 010 (formerly regulated as Bubble Outfall 200)

Water Quality Based Effluent Limitations are being applied at the individual Outfalls 005 and 010 in this renewed permit. The combination (bubble) Outfall 200 will no longer be used. During the response to Discovery review in the US Steel Selenium metal translator appeal, a review of US Steel's DMR's was conducted. During this review it was noticed on some DMR's that all of the Selenium data was below the Limit of Quantitation at Outfalls 005 and 010. Selenium would then be reported as a value of zero at Outfall 200. Outfall 200 was the mathematical combination of values for the individual values at the respective outfalls 005 and 010. While the monthly average calculation based on the rules in the GLI may allow a zero to be reported, the daily values and the highest monthly value should have been something above zero. In light of this it was determined that the values reported at the bubble may not be a true indication of what was being discharged into the Grand Calumet River at the individual outfalls. A decision was made to apply the effluent limitations at the respective individual outfalls.

In the previous permit, Outfall 200 had limits on the following parameters: Ammonia (as N), Free Cyanide, Phenols (4AAP), Fluoride, Selenium, Benzene, and Benzo(a)pyrene.

The following parameters showed reasonable potential based upon analysis required in 327 IAC 5-2-11.5: Mercury (005 and 010), Benzo(a)pyrene (005 and 010), Total Residual Chlorine (005 and 010), and Free Cyanide (005 and 010). The current review of data indicates that selenium does not show a reasonable potential due to the most recent monitoring data but the limits are retained due to source and nature of the discharge. This is allowed under 327 IAC 5-2-11.5(a).

United States Steel made an official request on January 22, 2007 to modify their application and have the proposed permit modified to allow the discharge flows currently discharged through Outfall 010 to be redirected and included in Outfall 005. An additional discharge limitations table (Part I.A.2. of the permit) was added to accommodate this request. Requirements for Outfall 010 (Part I.A.3. of the permit) apply until the flows are redirected to Outfall 005.

Fluoride

It is proposed to drop fluoride limits from the effluent limitations. Fluoride was added as a parameter of concern during the Coke Plant Modification. US Steel submitted additional toxicity information as part of their compliance schedule that was used in developing a revised Tier II value for fluoride. Based upon this updated Tier II value, US Steel no longer shows reasonable potential to exceed the water quality standards for Fluoride at Outfalls 005 and 010. However, fluoride is a component of the US Steel discharge from Outfall 005 and continued monitoring on a 2 times per month basis will be required. The requirement for monitoring Fluoride at Outfall 010 has been removed from this renewed permit.

Benzene

Based upon a limited number of data values taken during the application for the Coke Plant Modification, benzene showed reasonable potential in 1997. Based upon the application that included values from a data set of almost 400 data points, benzene no longer shows reasonable potential to exceed water quality standards and the limits are no longer required. Since the coke plant is a major source of benzene and the use of the groundwater will potentially add significant quantities of Benzene to the system, the monitoring of Benzene at Outfall 005 at 3 times per month will continue. In order to limit the amount of Benzene discharged from the Internal Outfall 501, mass limits using the NSPS from the 1982 ELGs have been retained in this permit using BPJ.

Since the effluent limitations for benzo(a)pyrene are based upon the additivity rules and benzene is the other parameter in this derivation the monitoring of benzene is being added back to Outfall 010 at 3 X Monthly in the final permit.

Ammonia

Ammonia is regulated in the current permit at both the internal and final outfalls. Based on the current treated effluent data there is not a reasonable to exceed when compared to the water quality based effluent limits. The limits from the previous permit are not appropriate to carry over because they are less stringent than the currently calculated water quality based effluent limits. The ammonia is limited at the source and that is at the internal outfall (501).

Because of the change in the production quantities at Outfall 501 (lower) and a revision to the Effluent Guidelines (more stringent), and the removal of the allocation attributed to the potential discharge from 508 (Outfall 010), the allowable limits do not exceed the projected water quality based effluent limits. Numeric WQBELs are not required but monitoring requirements will remain.

Mercury

The discharge from Outfalls 005 and 010 exhibits a reasonable potential to exceed water quality based effluent limitations for Mercury. Limitations for Mercury will be placed in

the permit and a five year compliance schedule is included in the permit to meet the effluent limitations for Mercury.

Selenium

Selenium was added to the permit at the time of the Coke Plant Modification issued in February 1998. It showed reasonable potential to exceed water quality based effluent limits. Selenium was under a compliance schedule with final effluent limits to take effect by April 1, 2003. US Steel submitted a metal translator study on April 19, 2002. A review of the study was completed and the results of the review were sent to US Steel in a letter dated August 26, 2002. US Steel did request the use of an alternate translator by using site-specific data but must conduct a site-specific study to identify the ratio of the dissolved fraction to the total recoverable fraction for a metal in the receiving waterbody outside the mixing zone. US Steel submitted the metal translator study for selenium which was reviewed by IDEM and a letter was sent to US Steel on February 16, 2006 with a final determination. Based upon the results of the study, a modification to the final selenium limit will not be required.

The review of the most recent discharge data indicates that selenium does not show a reasonable potential but the limits are retained due to source and nature of the discharge. This is allowed under 327 IAC5-2-11.5(a).

Phenols (4AAP)

BAT limits for Phenols (4AAP) were included in the previous permit. The calculated BAT limits at Outfalls 501, which are the main source of Phenols at the final Outfall will be limited at the internal outfall 501. No limitations or monitoring requirements for Phenols (4AAP) are proposed for either Outfall 005 or 010.

Total Residual Chlorine

US Steel uses chlorine for zebra mussel control and is limited on the permitted outfalls that include non-contact cooling waters. Outfalls 005 and 010 will be limited for Total Residual Chlorine (TRC).

Free Cyanide

Water Quality Based Effluent Limits for free cyanide continue for Outfalls 005 and 010. A reasonable potential analysis was done per 327 IAC 5-2-11.5 and free cyanide has the reasonable potential to exceed the water quality based effluents for this segment at both Outfalls 005 and 010. These limits are based upon the exclusion of the site specific criterion calculated in the February 1998 modification.

In the permit renewal application submitted on March 9, 1999, United States Steel requested continued application of the site-specific criteria for cyanide as approved by IDEM in the February 25, 1998 modification to the permit.

IDEM previously granted US Steel's request, pursuant to 327 IAC 2-1.5-16(a)(1)(B)(ii), for site-specific cyanide criteria. This provision allows aquatic life criteria to be modified on a site-specific basis when the sensitivity of the aquatic organisms species that occur at the site differs from the species actually tested in developing the criteria.

"Occur at the site" is defined at 327 IAC 2-1.5-2(60) as follows:

(60) "Occur at the site" includes the species, genera, families, orders, classes, and phyla that:

(A) are usually present at the site;

(B) are present at the site only seasonally due to migration;

(C) are present intermittently because they periodically return to or extend their ranges into the site;

(D) were present at the site in the past, are not currently present at the site due to degraded conditions, and are expected to return to the site when conditions improve; or

(E) are present in nearby bodies of water, are not currently present at the site due to degraded conditions, and are expected to be present at the site when conditions improve.

The taxa that occur at the site cannot be determined merely by sampling downstream and upstream of the site at one (1) point in time. The term does not include taxa that were once present at the site but cannot exist at the site now due to permanent physical alteration of the habitat at the site, for example, alterations resulting from dams.

Salmonids were one of the species included in the database used to calculate the cyanide criteria set forth in 327 IAC 2-1.5-8(b)(3). When IDEM granted US Steel's request for site-specific cyanide criteria, IDEM did not have conclusive data documenting the presence of salmonids in the upper reach of the East Branch of the Grand Cal River. Therefore, IDEM approved the site-specific criteria that were calculated using the recalculation procedure, resulting in the removal of salmonids from the database. This in turn resulted in less stringent acute and chronic criteria than provided for in 327 IAC 2-1.5-8(b)(3).

Salmonids have recently been found in the East Branch of the Grand Calumet River, including the stretch in which the site-specific cyanide criteria apply. More specifically, a study conducted by the US Fish & Wildlife Service between September and November of 1999 documented the presence of 465 chinook salmon and three rainbow trout. US Steel itself, in its report entitled "Derivation of Baseline Bioaccumulation Factors from Grand Calumet River Field Measured BAFs for Benzo(a)pyrene," documented the presence of chinook salmon at the Virginia Street and Tennessee Street bridges. Additionally, IDEM documented the presence of approximately 100 chinook salmon

when it investigated a fish kill between Outfall 005 and the Tennessee Bridge in the East Branch in October of 2001.

Because the presence of salmonids in the East Branch has recently been verified, IDEM has developed water quality based effluent limits for the permit renewal utilizing the criteria with salmonids included in the database.

US Steel in their comments on the 2003 draft of this permit included additional data and a request to include only adult salmonid data in the database for the re-calculation of Free Cyanide. Based upon the review by IDEM the site-specific criteria will be developed using the Recalculation Procedure taking into consideration the seasonal presence of salmonids in the Grand Calumet River. Sampling by IDEM and USFWS has shown that adult Steelhead Trout and Chinook Salmon are present in the Grand Calumet River only during the Autumn and possibly Winter Months. The site-specific cyanide criteria will therefore have a seasonal component. "Salmonids absent" criteria will be applied during the months when salmonids are not expected to be in the US Steel portion of the Grand Calumet River near Outfalls 005 and 010, and "adult salmonids present" criteria will be applied when salmonids are expected to be present in the US Steel portion of the Grand Calumet River near Outfalls 005 and 010. The "adult salmonids present" criteria will be developed using only adult salmonid data since salmon do not breed in the Grand Calumet River and thus only adults will be found there. Attached to this Fact Sheet as Attachment V are the re-calculations for salmonids absent and Adult salmonid present. This site specific data was used to calculate seasonal limits and were approved for use in this permit in the 2005 Fast Track Rule Making.

The site-specific criterion developed for the last permit for salmonids absent is carried over and included in this permit for the same segments near Outfalls 005 and 010.

The season which includes salmonids absent is April 1 through September 30 and the season whereby salmonids are considered present is from October 1 through March 31. If US Steel wishes to conduct appropriate studies to determine some alternate season, then US Steel should contact IDEM to determine the appropriate procedures for the development of the studies necessary to determine an alternate season.

The water quality based effluent limits calculated in Attachment IV Table 13 for both Outfalls 005 and 010 are less stringent for Free Cyanide for the Season absent Salmonids than the limits from the previous permit and will not be increased due to anti-backsliding considerations. However, a decision was made to reduce the allowable mass allocations at Outfall 005 so they don't exceed the levels in the existing permit. When Outfall 010 combines with Outfall 005, the mass limits will equal those in the current permit. Until the discharge from Outfall 010 combines with Outfall 005, the mass limits at Outfall 005 are reduced by those at Outfall 010. As a result of this decision both mass and concentration limits are more stringent than the water quality based effluent limits permitted. The Tables in the permit and fact sheet have been adjusted to reflect this reduction.

Benzo(a)pyrene

IDEM developed Tier II benzo(a)pyrene (BaP) human health values for the Great Lakes System in August 1997 pursuant to 327 IAC 2-1.5-14. The human health values were developed by taking into account several factors, including the bioaccumulation factor (BAF) for BaP. Indiana rules allow BAFs to be calculated using four different methods, depending on the type of data available. Due to the limited availability of bioaccumulation data for BaP, IDEM calculated the BAFs for BaP using only the fat solubility (Kow) of BaP as required by 327 IAC 2-1.5-13(c). As part of 1998 Coke Plant modification, US Steel was given a five year compliance schedule to meet the final effluent limitations. That compliance schedule allowed US Steel to submit studies that could update the Tier I value used to calculate the final effluent limitation.

In March 2000, US Steel submitted proposed field measured BAFs for benzo(a)pyrene (BaP) to replace the BAFs calculated by IDEM (which would allow IDEM to calculate Tier I BaP human health criteria). The field study submitted by US Steel provided fish tissue and water concentrations of BaP collected from the East Branch of the Grand Calumet River where the US Steel facility is located. IDEM accepted most of the data submitted by US Steel for use in developing new BaP BAFs. Based on the data submitted to IDEM and the BAF methodologies in 327 IAC 2-1.5-13, IDEM recalculated the BaP human health BAFs and utilized these BAFs to develop Tier I human health criteria. Limits were recalculated and included in this permit. US Steel has been given a thirty-four (34) schedule of compliance to meet the final limits for benzo(a)pyrene at Outfall 005 and a twenty-four (24) at Outfall 010.

The water quality based effluent limits for benzo(a)pyrene were based upon the additivity requirements as specified in 327 IAC 5-2-11.4.

Monitoring Requirements

Monitoring requirements will be retained for Lead (010), Zinc (010), Chlorides (005 and 010), Sulfates (005 and 010), and Fluoride (005). Although these did not show reasonable potential they are still parameters of concern for this type of discharge and continued monitoring has been required.

Outfall 005 (without flows from 010)

DISCHARGE LIMITATIONS Outfall 005

<u>Parameter</u>	<u>Quantity or Loading</u>			<u>Quality or Concentration</u>			<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>	<u>Units</u>		
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	Report	Report	mg/l	2 X Weekly	3 Grabs/24 Hrs.
Selenium	2.1	4.1	lbs/day	4.1	8.2	ug/l	1 X Weekly	24-Hr. Comp.
Benzene	Report	Report	lbs/day	Report	Report	ug/l	3 X Monthly	3 Grabs/24-Hrs.
Benzo-a-pyrene								
Interim	Report	Report	lbs/day	Report	1.0	ug/l	2 X Weekly	24-Hr. Comp.
Final	0.047	0.12	lbs/day	0.093	0.23	ug/l	2 X Weekly	24-Hr. Comp.
Ammonia (as N)	Report	Report	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.

Free Cyanide								
Season 1	3.447	8.08	lbs/day	6.9	16.1	ug/l	2 X Weekly	See Part I.Q.
Season 2	3.0	6.6	lbs/day	6.0	13	ug/l	2 X Weekly	See Part I.Q.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00066	0.0016	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Total Residual Chlorine	4.0	9.1	lbs/day	8	18	ug/l	Daily	Grab
Fluoride	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Chloride	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Sulfate	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Whole Effluent Toxicity Testing (WETT)				1.0		TU _c	1 X Quarter	24-Hr. Comp.
Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
				Minimum	Maximum			
				Daily	Daily			
pH				6.0	9.0	s.u.	3 X Weekly	Grab

US Steel on January 22, 2007 requested that the permit be set up for the eventual redirection of the flow from Outfall 010 to 005. An additional discharge limitations table was created in the permit as Part I.2. that updates Outfall 005 to include the current discharge of 010.

Outfall 005 (with flows from 010)

DISCHARGE LIMITATIONS

Outfall 005

Parameter	Quantity or Loading		Units	Quality or Concentration		Units	Monitoring Measurement Frequency	Requirements Sample Type
	Monthly Average	Daily Maximum		Monthly Average	Daily Maximum			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	Report	Report	mg/l	2 X Weekly	3 Grabs/24 Hrs.
Selenium	2.1	4.2	lbs/day	4.1	8.2	ug/l	1 X Weekly	24-Hr. Comp.
Benzene	Report	Report	lbs/day	Report	Report	ug/l	3 X Monthly	3 Grabs/24-Hrs.
Benzo-a-pyrene								
Interim	Report	Report	lbs/day	Report	1.0	ug/l	2 X Weekly	24-Hr. Comp.
Final	0.047	0.12	lbs/day	0.093	0.23	ug/l	2 X Weekly	24-Hr. Comp.
Ammonia (as N)	Report	Report	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.
Free Cyanide								
Season 1	3.5	8.2	lbs/day	6.9	16.1	ug/l	2 X Weekly	See Part I.Q.
Season 2	3.1	6.6	lbs/day	6.0	13	ug/l	2 X Weekly	See Part I.Q.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00066	0.0016	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Total Residual Chlorine	4.1	9.2	lbs/day	8	18	ug/l	Daily	Grab
Fluoride	Report	Report	lbs/day	Report	Report	ug/l	2 X Monthly	24-Hr. Comp.
Chloride	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Sulfate	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Whole Effluent Toxicity Testing (WETT)				1.0		TU _c	1 X Quarter	24-Hr. Comp.
Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
				Minimum	Maximum			
				Daily	Daily			
pH				6.0	9.0	s.u.	3 X Weekly	Grab

Internal Outfall 501

When Outfall 501 was set up for discharges from the Coke Plant (Outfall 501), effluent limitations from the federal effluent guideline were based upon the 1982, New Source Performance Standards (NSPS). The 2002 modification to the effluent guidelines are

now in effect. Limits for TSS, Oil and Grease, and Benzene are determined from the 1982, New Source Performance Standards (NSPS) using BPJ. Limits for the other parameters are the most stringent of the 2002 BAT limits from the updated guideline or the 1982 NSPS whichever are the most stringent.

DISCHARGE LIMITATIONS

Internal Outfall 501

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
TSS	706	1,359	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Oil & Grease	-----	50.4	lbs/day	Report	Report	mg/l	2 X Weekly	3 Grabs/24 Hrs.
Selenium	Report	Report	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.
Benzene	Report	0.25	lbs/day	Report	Report	ug/l	3 X Monthly	3 Grabs/24-Hrs.
Benzo-a-pyrene	0.08	0.15	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.
Naphthalene	0.09	0.15	lbs/day	-----	Report	ug/l	2 X Weekly	24-Hr. Comp.
Phenols (4AAP)	0.25	0.50	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.
Ammonia (as N)	27.9	40.4	lbs/day	Report	Report	ug/l	2 X Weekly	24-Hr. Comp.
Cyanide								
Total	27.7	41.0	lbs/day	Report	Report	ug/l	2 X Weekly	See Part I.Q.
Free	Report	Report	lbs/day	Report	Report	ug/l	2 X Weekly	See Part I.Q.
				Minimum	Maximum			
pH				Daily	Daily			
				Report	Report	s.u.	1 X Weekly	Grab

Internal Outfall 502 (deleted)

Outfall 010DISCHARGE LIMITATIONS

Outfall 010

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	-----	Report	mg/l	2 X Weekly	3 Grabs/24 Hrs.
Total Residual Chlorine	0.055	0.12	lbs/day	8	18	ug/l	Daily	Grab
Benzo-a-pyrene								
Interim	Report	Report	lbs/day	Report	1.0	ug/l	2 X Weekly	24-Hr. Comp.
Final	0.00064	0.0016	lbs/day	0.093	0.23	ug/l	2 X Weekly	24-Hr. Comp.
Ammonia (as N)	Report	Report	lbs/day	Report	Report	ug/l	2 X Monthly	24-Hr. Comp.
Benzene	Report	Report	lbs/day	Report	Report	ug/l	3 X Monthly	3 Grabs/24-Hrs.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.000090	0.000022	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Chloride	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Sulfate	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Free Cyanide	.							
Season 1	0.053	0.12	lbs/day	7.6	18	ug/l	1 X Weekly	See Part I.Q.
Season 2	0.046	0.090	lbs/day	6.7	13	ug/l	1 X Weekly	See Part I.Q.
Temperature	-----	-----	-----	-----	Report	°F	1 X Weekly	6 Grabs/24-Hrs.
Whole Effluent Toxicity				See Part. I.L. of the Permit				

pH	Minimum Daily 6.0	Maximum Daily 9.0	s.u.	3 X Weekly	Grab
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Internal Outfall 508 (Deleted)

Individual Monitoring of Outfalls 015, 607, and 017

Discharge limitations and monitoring requirements are required separately for Outfalls 015, 017 and 607. Water Quality Bubble (Combined 015 and 017) Outfall 400 has been separated into limitations at the respective outfalls. Outfall 015 includes some non-contact cooling water that requires temperature monitoring. In addition, Internal Outfall 607 (SWD-1), treated landfill leachate and associated wastewaters, are discharged through Outfall 015. Outfall 017 will be closed and removed from the permit.

Table 4 in Attachment IV (Reasonable Potential Tables) shows the reasonable potential to exceed current water quality standards analysis as required in 327 IAC 5-2-11.5. Mercury has the reasonable potential to exceed water quality standards and require water quality based effluent limitations and limits have been placed in the permit. Reasonable potential for Total Residual Chlorine exists because of chlorine added at the intake structures for zebra mussel control. Mass limitations for ammonia, Total Cyanide, and Phenols (4AAP) were in the previous permit. These parameters were placed in the permit to determine if cross contamination from process wastewater is occurring. Continued monitoring for ammonia is proposed. Instead of monitoring for Total Cyanide it is proposed to require monitoring of Free Cyanide. Increased levels of ammonia or Free Cyanide should be investigated to determine the source and those sources will be eliminated.

Through a previous permit modification, the blast furnace recycle system discharge was relocated to Outfall 010. Since the source of the requirement for the original mass limitations for Total Cyanide, Lead, Zinc, and Phenols (4AAP) has been relocated from Outfall 017 to Outfall 010, and no reasonable potential exists, mass limitations for these parameters are removed from Outfalls 015. However, concentrations are at levels sufficient to require continued monitoring for lead and zinc at Outfalls 015 and is being retained in the permit at 1X Weekly. Free Cyanide and ammonia will be monitored as stated above.

Individual discharge limitations requirements for Outfalls 015, and 607, and are detailed below:

Outfall 015

DISCHARGE LIMITATIONS

Outfall 015

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>		<u>Monthly</u>	<u>Daily</u>			
	<u>Average</u>	<u>Maximum</u>		<u>Average</u>	<u>Maximum</u>			

Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Total Suspended Solids	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Weekly	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
CBOD ₅	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Free Cyanide	Report	Report	lbs/day	Report	Report	ug/l	1 X Weekly	See Part I.Q.
Phenols (4AAP)	Report	Report	lbs/day	Report	Report	ug/l	1 X Weekly	24-Hr. Comp.
Lead	Report	Report	lbs/day	Report	Report	ug/l	1 X Weekly	24-Hr. Comp.
Zinc	Report	Report	lbs/day	Report	Report	ug/l	1 X Weekly	24-Hr. Comp.
Temperature	-----	-----	-----	-----	Report	°F	1 X Weekly	6 Grabs/24-Hrs.
Total Residual Chlorine	0.11	0.26	lbs/day	8	18	ug/l	Daily	Grab
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.000018	0.000045	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
				Minimum	Maximum			
				Daily	Daily			
pH				6.0	9.0	s.u.	1 X Weekly	Grab

Outfall 607 is the Internal Outfall for the SWD-1 Landfill contributing to Outfall 015

Internal Outfall 607: Through a previous permit modification in 1996, Internal Outfall 607 was added to monitor the discharge from the Solid Waste Disposal 1 (SWD-1) leachate which ultimately discharges through Outfall 015. A new landfill was constructed on-site and the following wastewater is currently generated: decant pad water, truck wash water, Solid Waste Disposal 1 leachate, and vacuum truck free liquids.

Treatment of the leachate consists of equalization, neutralization, chemical precipitation, and microfiltration.

A review of the monitoring data at 607 in the renewal application indicates a potentially high value for CBOD₅. This was only one sampling value. To determine a better wastewater characterization for this discharge and the discharge from Outfall 015, monitoring requirements for CBOD₅ have been included in the permit.

Other than adding the monitoring requirements for CBOD₅, there are no changes to the limitations or monitoring requirements for Outfall 607 from the previous permit modified in August 1999.

DISCHARGE LIMITATIONS

Outfall 607

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Total Suspended Solids	Report	Report	lbs/day	30	60	mg/l	1 X Weekly	24-Hr. Comp.
Oil & Grease	-----	-----	-----	10.0	15.0	mg/l	1 X Weekly	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
CBOD ₅	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Free Cyanide	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	See Part I.Q.
Phenols (4AAP)	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	24-Hr. Comp.
Lead	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	24-Hr. Comp.

Zinc	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	24-Hr. Comp.
Benzo(a)pyrene	Report	Report	lbs/day	Report	Report	mg/l	1 X Quarter	24-Hr. Comp.
pH				Minimum Daily -----	Maximum Daily Report	s.u.	1 X Weekly	Grab

Outfall 017

Per correspondence from US Steel dated November 26, 2008 this Outfall will now be taken completely out of service prior to the effective date of this permit. The final closure of Outfall 017 will be completed by June 30, 2009. Outfall 017 has been removed from this permit.

Outfalls 018 and 019, Bubble Outfall 300

Bubble Outfall 300 is no longer included in the permit. Individual Outfalls 018 and 019 are now limited separately.

Outfall 018

Table 5 in Attachment IV (Reasonable Potential Tables) shows the reasonable potential to exceed current water quality standards analysis as required in 327 IAC 5-2-11.5. Mercury has the reasonable potential to exceed water quality standards and require water quality based effluent limitations to be placed in the permit. Reasonable potential for Total Residual Chlorine exists because of chlorine added at the intake structures for zebra mussel control. The ammonia limitations were based upon a trigger level established in an earlier consent decree. Because there are no significant sources of ammonia, the trigger limits are removed, however, continued monitoring will be required. Monitoring Phenols (4AAP) and T. Cyanide were established to determine if leaks or spills occurred in the system. The monitoring of Phenols (4AAP) and T. Cyanide are carried over from the previous permit for this same reason, except T. Cyanide is being replaced with F. Cyanide. Mass limitations are based upon a flow from Outfall 018 of 58.2 MGD.

DISCHARGE LIMITATIONS**Outfall 018**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	Report	Report	mg/l	1 X Weekly	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Free Cyanide	-----	Report	lbs/day	-----	Report	mg/l	1 X Monthly	See Part I.Q.
Phenols (4AAP)	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	24-Hr. Comp.
Copper	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00063	0.0016	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab

Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
Total Residual Chlorine	3.9	8.7 [8]	lbs/day	8	18	ug/l	Daily	Grab
pH				Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Weekly	Grab

Outfall 019

Table 6 in Attachment IV (Reasonable Potential Tables) shows the reasonable potential to exceed water quality standards analysis as required in 327 IAC 5-2-11.5. Mercury has the reasonable potential to exceed water quality standards and require water quality based effluent limitations to be placed in the permit. Reasonable potential for Total Residual Chlorine exists because of chlorine is added at the intake structures for zebra mussel control. The ammonia limitations were based upon a trigger level established in an earlier consent decree. Because there are no significant sources of ammonia, the trigger limits are removed, however, continued monitoring will be required. Monitoring Phenols (4AAP) and T. Cyanide were established to determine if leaks or spills occurred in the system. The monitoring of Phenols (4AAP) and T. Cyanide are carried over from the previous permit for this same reason. However, Total Cyanide monitoring has been replaced with Free Cyanide. Mass limitations are based upon a flow from Outfall 019 of 49.3 MGD.

DISCHARGE LIMITATIONS**Outfall 019**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	Report	Report	mg/l	1 X Weekly	Grab
Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
Free Cyanide	-----	Report	lbs/day	-----	Report	mg/l	1 X Monthly	See Part I.Q.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00053	0.0013	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Phenols (4AAP)	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	24-Hr. Comp.
Total Residual Chlorine	3.3	7.4	lbs/day	8	18	ug/l	Daily	Grab
pH				Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Weekly	Grab

Outfall 020

Table 7 in Attachment IV (Reasonable Potential Tables) shows the reasonable potential to exceed water quality standards analysis as required in 327 IAC 5-2-11.5. Mercury has the reasonable potential to exceed water quality standards and requires the water quality based effluent limitations to be placed in the permit. Reasonable potential for Total Residual Chlorine exists because chlorine is added at the intake structures for zebra mussel control. Monitoring requirements for Lead and Zinc are continued at Outfall 020

based upon Best Professional Judgment. Mass limitations are based upon a flow of 80.6 MGD.

DISCHARGE LIMITATIONS

Outfall 020

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	Report	Report	mg/l	1 X Weekly	Grab
Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
Lead	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Zinc	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Ammonia	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00087	0.0022	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Total Residual Chlorine	5.4	12	lbs/day	8	18	ug/l	Daily	Grab
				Minimum	Maximum			
				Daily	Daily			
pH				6.0	9.0	s.u.	1 X Weekly	Grab

Outfalls 021, 023, and 026

Outfall 021 consists of air compressor non-contact cooling water, steam condensate, and some storm water. Any discharge of non-contact cooling water would potentially have a chlorine residual, therefore limits for TRC have been included at Outfall 021. This is consistent with all of the Outfalls containing non-contact cooling waters.

Outfall 023 consists of intermittent flows of steam condensate, air conditioning condensate from the hospital and other buildings, and some storm water.

Outfall 026 is currently inactive and no monitoring will be required as long as the outfall is inactive but monitoring requirements are established if it becomes active again. Monitoring from the previous permit consisted of Oil and Grease.

Outfall 021

DISCHARGE LIMITATIONS

Outfall 021

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Monthly	Grab
Total Residual Chlorine	0.040	0.090 [2]	lbs/day	8	18	ug/l	Daily	Grab
Ammonia	Report	Report	lbs/day	Report	Report	ug/l	2 X Monthly	Grab

pH	-----	-----	Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Monthly	Grab
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Outfall 023**DISCHARGE LIMITATIONS****Outfall 023**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Monthly	Grab
Ammonia	Report	Report	lbs/day	Report	Report	ug/l	2 X Monthly	Grab

pH	-----	-----	Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Monthly	Grab
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Outfall 026

Outfall 026 is currently inactive but covered under this permit. Monitoring requirements are established in case US Steel re-activates this outfall. US Steel shall notify IDEM at least 30 days prior to re-activation.

DISCHARGE LIMITATIONS**Outfall 026 (Inactive)**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Monthly	Grab

pH	-----	-----	Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Monthly	Grab
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Outfalls 028/Outfall 030, Bubble Outfall 600

Table 8 in Attachment IV (Reasonable Potential Tables) shows the reasonable potential to exceed analysis as required in 327 IAC 5-2-11.5. Mercury has the reasonable potential to exceed the current water quality based effluent limitations and thus require water quality based effluent limits to be placed in the permit. Reasonable potential for Total Residual Chlorine exists because chlorine is added at the intake structures for zebra mussel control. Mass limitations are calculated based upon a flow through Outfall 028/030 of 28.2 MGD.

EPA has provided additional guidance to IDEM on determining the need for water quality based effluent limits at the final outfall using TBELs determined appropriate at an

internal outfall. This approach is separate from the RPE statistical analysis done during the modeling phase of permit development. Once the TBELs are calculated these are then compared to the WQBELs using the allowed mass calculated for the TBELs. If the TBELs calculated mass exceed the WQBELs mass then there is a reasonable potential to exceed a water quality criterion and WQBELs are required at the final outfall. For Outfall 028/030, water quality based effluent limits for lead are triggered.

Monitoring is being required for Zinc and Fluoride. The main source of Lead and Zinc is Internal Outfall 603 and the calculated Federal Effluent Guideline limits have been placed there. Outfall 603 discharges to the lagoon system for further treatment prior to discharging through Outfalls 028/030.

DISCHARGE LIMITATIONS

Outfall 028/030 (Outfall 600)

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Total Suspended Solids	2,038	5,933	lbs/day	Report	Report	mg/l	5 X Weekly	24-Hr. Comp.
Oil & Grease	1,274	2,807	lbs/day	Report	Report	mg/l	5 X Weekly	3 Grabs/ 24 Hrs.
Lead	6.1	12	lbs/day	0.026	0.052	mg/l	2 X Weekly	24-Hr. Comp.
Zinc	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab
Final	0.00031	0.00075	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Ammonia	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Fluoride	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Total Residual Chlorine	1.9	4.2 [8]	lbs/day	8	18	ug/l	Daily	Grab
Temperature	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
Whole Effluent Toxicity			See Part I.L., Biomonitoring Requirements					
				Minimum Daily	Maximum Daily			
pH				6.0	9.0	s.u.	1 X Weekly	Grab

Internal Outfall 603 discharging via Outfalls 028/030

Internal Outfall 603 is regulated by the federal effluent guidelines for discharges from steelmaking, continuous casting and vacuum degassing operations. The limits for Lead were changed to Report Only at Internal Outfall 603 since the final effluent limits at the final Outfall are the more stringent water quality based effluent limit (WQBEL).

DISCHARGE LIMITATIONS

Internal Outfall 603

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Lead	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Zinc	11.88	36.38	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
pH	-----	-----	-----	-----	Report	s.u.	1 X Weekly	Grab

Outfall 032

Outfall 032 consists of miscellaneous QA non-contact cooling water, miscellaneous bar mill freeze protection water, steam condensate, and some storm water. Reasonable potential for Total Residual Chlorine exists because of chlorine added at the intake structures for zebra and quagga mussel control. Monitoring for Oil and Grease and the pH limitations at this outfall are carried over from the previous permit. Mass limitations calculated were based upon a flow of 0.3 MGD.

DISCHARGE LIMITATIONS Outfall 032

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Monthly	Grab
Total Residual Chlorine	0.020	0.045	lbs/day	8	18	ug/l	Daily	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
				Minimum Daily	Maximum Daily			
pH	-----	-----		6.0	9.0	s.u.	1 X Monthly	Grab

Outfall 033

Outfall 033 consists of discharges of non-contact cooling water from the sheet & tin mill, atmospheric gas plant non-contact cooling water, Buchanan Street sanitary lift station emergency overflow (SOF-1), EJ&E miscellaneous intermittent flows, steam condensate, and some storm water. Monitoring for Phenols (4AAP) and Oil & Grease are required to ensure that possible leaks of process waters from the tin lines are detected. Limitations for pH are carried over from the previous permit. Reasonable potential for Total Residual Chlorine exists because of chlorine added at the intake structures for zebra mussel control, and mass limitations are based upon a flow of 0.2 MGD.

DISCHARGE LIMITATIONS Outfall 033

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Monthly	Grab
Phenols (4AAP)	-----	Report	lbs/day	-----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Total Residual Chlorine	0.013	0.030	lbs/day	8	18	ug/l	Daily	Grab
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
				Minimum Daily	Maximum Daily			
pH	-----	-----		6.0	9.0	s.u.	1 X Monthly	Grab

Outfall 034

Outfall 034 consists of discharges from the process lines that are monitored and regulated by Internal Outfalls 604, 605, and 606. Mass limitations calculated from water quality based effluent concentration values were based upon a flow of 25.4 MGD. The previous permit contained both water quality and federal effluent guideline limitations at Outfall 034. This permit moves back to the internal outfalls much of the federal effluent guideline limitations except for Oil & Grease which is regulated at Outfall 034. The previous permit contained Oil and Grease limits that were based upon best professional judgment and were more stringent limits than the calculated ELGs allow. Because of changes in the Oil & Grease limits, the final limits at Outfall 034 are more stringent than in the previous permit. Other limitations that are based upon water quality standards are retained at Outfall 034.

CBOD5

US Steel on several occasions, including a letter dated August 9, 2002, has requested that the CBOD5 effluent limitations at Outfall 034 be re-evaluated. In a letter to US Steel dated August 20, 2003, IDEM informed US Steel that the model for BOD-DO has not changed for this permit. Since the original data used in the previous model is still the most current available data at this time, the CBOD-DO limitations from the 1992 WLA are still applicable and the appropriate mass limits have been carried over to this permit.

Mercury

Water quality based effluent limitations were developed using 327 IAC 5-2-11.4 and reasonable potential determinations using 327 IAC 5-2-11.5. Water quality based effluent limits are shown for parameters of concern in the reasonable potential to exceed in Table 9 Attachment IV. Corresponding mass limitations are based upon a flow of 25.4 MGD.

Total Residual Chlorine (TRC)

Reasonable potential for TRC exists because of chlorine added at the intake structures for zebra mussel control.

Phenols (4AAP)

Because this is a parameter of concern for the Iron and Steel category the limitations for Phenols (4AAP) has been carried over from the previous permit.

Lead

EPA has provided additional guidance to IDEM on determining the need for water quality based effluent limits at the final outfall using TBELs determined appropriate at an internal outfall. This approach is separate from the RPE statistical analysis done during the modeling phase of permit development. Once

the TBELs are calculated these are then compared to the WQBELs using the allowed mass calculated for the TBELs. If the TBELs calculated mass exceed the WQBELs mass then there is a reasonable potential to exceed a water quality criterion and WQBELs are required at the final outfall. For Outfall 034, water quality based effluent limits for lead are required. The previous permit had limits for lead that were water quality based and are more stringent than the currently calculated limits for lead. Therefore, the limits for lead from the previous permit are carried over due to anti-backsliding considerations. Increasing the limits for lead would have to meet both anti-backsliding and antidegradation considerations.

Copper, Cadmium, and Silver

EPA has provided additional guidance to IDEM on determining the need for water quality based effluent limits at the final outfall using TBELs determined appropriate at an internal outfall. This approach is separate from the RPE statistical analysis done during the modeling phase of permit development. Once the TBELs are calculated these are then compared to the WQBELs using the allowed mass calculated for the TBELs. If the TBELs calculated mass exceed the WQBELs mass then there is a reasonable potential to exceed a water quality criterion and WQBELs are required at the final outfall. For Outfall 034, water quality based effluent limits for copper, cadmium, and silver are triggered.

Ammonia, Total Chromium, Nickel and Zinc

Although numeric limits are not being required for these parameters at Outfall 034 monitoring on a 2 X Weekly basis is being required except for Nickel which is 1 X quarter.

Effluent limitations at Outfall 034 are detailed below:

DISCHARGE LIMITATIONS

Outfall 034

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
CBOD ₅								
Summer	1,334	2,669	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Winter	4,537	9,074	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Oil & Grease [5]	1,430	3,660	lbs/day	Report	Report	mg/l	5 X Weekly	3 Grabs/ 24 Hrs.
Total Suspended Solids	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Ammonia (as N)	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Lead [8]	2.52	5.85	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Zinc [8]	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Copper [8]	3.8	8.7	lbs/day	0.018	0.041	mg/l	2 X Weekly	24-Hr. Comp.
Cadmium [8]	2.3	3.4	lbs/day	0.011	0.016	mg/l	1 X Monthly	24-Hr. Comp.
Nickel [8]	Report	Report	lbs/day	Report	Report	mg/l	1X Quarterly	24-Hr. Comp.
Silver [8]	0.042	0.072	lbs/day	0.20	0.34	ug/l	2 X Monthly	24-Hr. Comp.
Total Chromium [8]	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Mercury								
Interim	Report	Report	lbs/day	Report	Report	ng/l	Bi-Monthly	Grab

Final	0.00028	0.00068	lbs/day	1.3	3.2	ng/l	Bi-Monthly	Grab
Phenols (4AAP)	26.00	39.00	lbs/day	Report	Report	mg/l	1 X Weekly	24-Hr. Comp.
Total Residual Chlorine	1.7	3.8	lbs/day	8	18	ug/l	See Footnote in permit	Grab
Temperature [3]	-----	-----	-----	-----	Report	°F	2 X Weekly	6 Grabs/24-Hrs.
Whole Effluent Toxicity				3.6	----	TU _c	Quarterly	24-Hr. Comp.
				Minimum	Maximum			
				Daily	Daily			
pH				6.0	9.0	s.u.	Daily	Grab
Dissolved Oxygen				5.0	---	mg/l	1 X Weekly	Grab

Internal Outfall 604 via Outfall 034

Internal Outfall 604 consists of process water from the No. 1 Tin-free Steel line, the No. 5 & 6 Electrolytic Tinning Lines, East Galvanizing Lines, the chrome reduction floor drains, and the spent chrome solutions from the tinning and galvanizing lines. Internal Outfall 604 is limited by the federal effluent guidelines and based on the production values provided have the following limitations. Federal Effluent Limitations were based upon 40 CFR 420 and 40 CFR 433. The previous permit did not include all of the guideline required parameters. This permit adds the remaining parameters appropriate to metal finishing guideline back into this permit. The additional parameters are Total Cyanide, Cadmium, Copper, Nickel, Silver and TTO. The TBEL limitations for Cadmium, Copper, and Silver were changed to Report Only at the internal outfall since the Water Quality Based Effluent Limits at Outfall 034 are more stringent. US Steel would always have to discharge below the TBEL levels to meet the final water quality based effluent limits developed using the Federal Effluent Guidelines.

Hexavalent Chrome was not in the previous permit. US Steel has Hexavalent Chrome Reduction Facilities which reduce the hexavalent chromium to trivalent chrome. The guideline based limits for Hex Chrome have been added at this outfall.

This permit has the same footnote at Internal Outfall 604 as the previous permit that Cyanide based solutions shall not be used in any metal finishing operations, unless expressly authorized by a modification of this permit.

DISCHARGE LIMITATIONS

Outfall 604

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Total Suspended Solids	2,901	6,455	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Oil & Grease	Report	Report	lbs/day	Report	Report	mg/l	5 X Weekly	3 Grabs/ 24 Hrs.
Total Recoverable Chromium	28.25	45.77	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Lead	15.07	35.34	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Zinc	33.42	70.00	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Total Cyanide	10.74	19.83	lbs/day	Report	Report	mg/l	1 X Quarter	See Part I.Q.
Cadmium	Report	Report	lbs/day	Report	Report	mg/l	1 X Quarter	24-Hr.Comp.
Hexavalent Chromium	0.15	0.46	lbs/day	Report	Report	mg/l	1 X Weekly	Grab
Copper	Report	Report	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Nickel	39.32	65.76	lbs/day	Report	Report	mg/l	1 X Quarter	24-Hr. Comp.
Silver	Report	Report	lbs/day	Report	Report	mg/l	2 X Monthly	24-Hr. Comp.
TTO	-----	35.19	lbs/day	-----	-----	----	1 X Monthly	24-Hr. Comp.

Naphthalene	-----	1.68	lbs/day	-----	Report	mg/l	2 X Weekly	24-Hr. Comp.
Tetrachloroethylene	-----	2.51	lbs/day	-----	Report	mg/l	2 X Weekly	2 Grabs/ 24 Hrs

Internal Outfall 605 via Outfall 034

Internal Outfall 605 limits discharges from the 84" hot strip mill and were based upon the limitations contained in the previous US Steel Gary Works permit which were more stringent than the mass limitations allocated by the federal effluent limitation guidelines. These were carried over from the then previous permit to the currently administered extended permit because they were more stringent. These same limitations will be carried over to the current permit for the same reasons using BPJ. The final limits for Oil and Grease are part of the limits developed as part of the trading between outfalls allowed under the federal effluent guidelines. This trading or bubble is the same as the one used to develop limits in the previous permit.

DISCHARGE LIMITATIONS**Outfall 605**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>		<u>Monthly</u>	<u>Daily</u>			
	<u>Average</u>	<u>Maximum</u>		<u>Average</u>	<u>Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Total Suspended Solids	725	2,175	lbs/day	Report	Report	mg/l	2 X Weekly	24-Hr. Comp.
Oil & Grease	-----	1,450	lbs/day	-----	Report	mg/l	5 X Weekly	3 Grab/ 24-Hrs.

Internal Outfall 606 via Outfall 034

Internal Outfall 606 was established as part of a proposed special condition that required US Steel to conduct routine monitoring of the 84" x 91 " sewer and initiate corrective actions whenever discharges of process materials or process wastewaters were noted. The discharge from the 84" x 91" sewer is regulated by the end-of-pipe effluent limitations applicable to Outfall 034. The purpose of the monitoring and special condition is to provide a mechanism for early detection of possible spills or leaks. These monitoring requirements are carried over from the previous permit.

DISCHARGE LIMITATIONS**Outfall 606**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly</u>	<u>Daily</u>		<u>Monthly</u>	<u>Daily</u>			
	<u>Average</u>	<u>Maximum</u>		<u>Average</u>	<u>Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	24-Hr. Total
Oil & Grease	----	----	----	----	Report	mg/l	1 X Weekly	Grab
Total Chromium	----	----	----	----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Zinc	----	----	----	----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Lead	----	----	----	----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Phenols (4AAP)	----	----	----	----	Report	mg/l	1 X Monthly	24-Hr. Comp.

Outfall 035

Outfall 035 consists of once through non-contact cooling water discharged from the No. 5 Power Generating Station, the Co-Generation Plant non-contact cooling water, intermittent amounts of steam condensate, and some storm water. Water Quality Based Effluent Limitations for Total Residual Chlorine are established based upon the reasonable potential for Total Residual Chlorine to exist in the discharge because of chlorine added at the intake structures for zebra mussel control. Mass calculations developed based upon a water quality effluent concentration value used a flow of 156.8 MGD. The previous permit included limitations for ammonia which are not being carried over to this permit. A reasonable potential calculation determined no reasonable potential exists and there is not a known source for this parameter except intake water which is Lake Michigan water.

Footnote [5] for this outfall contains a BTU limitation of 1.211 million BTU/Hr. This effluent limitation was a decision that was part of the 1996 Co-Gen permit modification. The 1.211 million BTU/Hr limitation was the capacity of waste heat that could be discharged and was determined to be an appropriate effluent limitation by IDEM and EPA. This permit effluent requirement is still an appropriate permit condition and is in this renewed permit.

DISCHARGE LIMITATIONS

Outfall 035

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	Daily	Continuous
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Weekly	Grab
Temperature								
Discharge	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Intake	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Thermal Discharge	See Footnote [5] in the permit for Effluent Limitations					BTU/Hr	Daily	Continuous
Total Residual Chlorine	10	24	lbs/day	8	18	ug/l	Daily	Grab
				Minimum	Maximum			
pH	-----	-----		Daily	Daily			
				6.0	9.0	s.u.	1 X Monthly	Grab

Outfall 036

This outfall is now covered under a separate permit and has been removed from this final permit.

Outfall 037

The discharge from Outfall 037 consists of non-contact cooling water from the sheet and tin mill areas. Monitoring of Oil and Grease, Zinc, and Phenols (4AAP) are carried over from the previous permit. Monitoring was established on a BPJ basis in the last permit to ensure that possible leaks of process materials or discharges of process wastewaters are

detected and corrected. Water Quality Based Effluent Limitations for Total Residual Chlorine are established based upon the reasonable potential to exceed analysis as required in 327 IAC 5-2-11.5 and are shown in Table 11 in Attachment IV. Mass calculations developed based upon a water quality effluent concentration value used a flow of 3.0 MGD.

DISCHARGE LIMITATIONS

Outfall 037

<u>Parameter</u>	Quantity or Loading		<u>Units</u>	Quality or Concentration		<u>Units</u>	Monitoring Measurement <u>Frequency</u>	Requirements Sample <u>Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow								
Interim	Report	Report	MGD	-----	-----	----	1 X Weekly	Estimate
Final	Report	Report	MGD	-	-	-	Daily	Continuous
Temperature								
Discharge								
Interim	-----	-----	-----	-----	Report	°F	1 X Week	Grab
Final	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Intake	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Thermal Discharge					Report	BTU/Hr	Daily	Continuous
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Weekly	Grab
Zinc	-----	Report	lbs/day	-----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Phenols (4AAP)	-----	Report	lbs/day	-----	Report	mg/l	1 X Monthly	24-Hr. Comp.
Total Residual Chlorine	0.20	0.45	lbs/day	8	18	ug/l	Daily	Grab
pH	-----	-----		Minimum Daily 6.0	Maximum Daily 9.0	s.u.	1 X Monthly	Grab

Outfall 039

Outfall 039 consists of the 84" Hot Strip Mill Reheat Furnace non-contact cooling water, the 84" Hot Strip Mill miscellaneous non-contact cooling water, the 84" Hot Strip Mill fire water distribution system, some intermittent amounts of steam condensate and cold well pump room flood protection water, the 84" Hot Strip Mill Roughing Mill Scale Pit Emergency Overflow, and some storm water. Water Quality Based Effluent Limitations for Total Residual Chlorine are established based upon the reasonable potential to exceed the water quality based effluent limits. Reasonable potential for Total Residual Chlorine exists because of chlorine added at the intake structures for zebra mussel control. Mass calculations developed based upon a water quality effluent concentration value used a flow of 55.0 MGD.

DISCHARGE LIMITATIONS

Outfall 039

<u>Parameter</u>	Quantity or Loading		<u>Units</u>	Quality or Concentration		<u>Units</u>	Monitoring Measurement <u>Frequency</u>	Requirements Sample <u>Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow								
Interim	Report	Report	MGD	-----	-----	----	1 X Weekly	Estimate
Final	Report	Report	MGD	-----	-----	-----	Daily	Continuous

Temperature Discharge								
Interim	-----	-----	-----	-----	Report	°F	1 X Week	Grab
Final	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Intake	-----	-----	-----	-----	Report	°F	1 X Hour	Continuous
Thermal Discharge					Report	BTU/Hr	Daily	Continuous
Oil & Grease	-----	-----	-----	-----	Report	mg/l	1 X Weekly	Grab
Total Residual Chlorine	3.7	8.3 [2]	lbs/day	8	18	ug/l	Daily	Grab
				Minimum	Maximum			
				Daily	Daily			
pH	-----	-----		6.0	9.0	s.u.	1 X Monthly	Grab

Outfall 040

On April 1, 2008 US Steel officially notified IDEM that US Steel has idled the Electrogalvanizing Line (EGL) and therefore, no wastewater discharge is occurring. Outfall 040 will be plugged. The discharge Table has been removed from the permit.

Outfalls 041A & B

Outfalls 041A & B discharge non-contact cooling water from the ore yard rectifier system.

DISCHARGE LIMITATIONS**Outfall 041A & 041B**

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	Report	Report	MGD	-	-	-	1 X Monthly	Estimate
Oil & Grease	-----	-----	-----	Report	Report	mg/l	1 X Monthly	Grab
Total Residual Chlorine	0.0057	0.013	lbs/day	8	18	ug/l	Daily	Grab
Zinc	Report	Report	lbs/day	Report	Report	mg/l	1 X Monthly	Grab
				Minimum	Maximum			
				Daily	Daily			
pH	-----	-----		6.0	9.0	s.u.	1 X Monthly	Grab

Water Intake Screen Backwash - Outfalls BW-1, BW-2, BW-3, BW-4, and BW-5

US Steel has five service water intake structures operating off of Lake Michigan. The Pump Screen Backwash from these facilities discharge to Lake Michigan and are designated as BW-1 BW-2, BW-3, BW-4, and BW-5. A sixth (BW-6) has been closed. The permit will include conditions covering the five active water intake screen backwash facilities.

DISCHARGE LIMITATIONS

<u>Parameter</u>	<u>Quantity or Loading</u>		<u>Units</u>	<u>Quality or Concentration</u>		<u>Units</u>	<u>Monitoring Measurement Frequency</u>	<u>Requirements Sample Type</u>
	<u>Monthly Average</u>	<u>Daily Maximum</u>		<u>Monthly Average</u>	<u>Daily Maximum</u>			
Flow	-----	Report	MGD	-----	-----	-----	Quarterly	Estimate

5. Special NPDES Permit Conditions and Monitoring Programs

The previous permit contained a number of special conditions and monitoring programs in addition to the interim and final effluent limitations and routine monitoring requirements. Reference is made to the permit for the specific requirements of each program.

Stormwater Requirements

The Gary Works permit issued in 1994 included provisions for US Steel to prepare a Storm Water Pollution Prevention Plan (SWPPP) at the Gary Works Facility. The SWPPP was finalized in 1996 and last revised in October 2007. US Steel has also implemented a separate SWPPP for the Coke Plant. The SWPPP for the Coke Plant Operations is consistent with the Gary Works SWPPP. The Coke Plant SWPPP was revised in April 1997 and September 1999. US Steel as part of their overall SWPPP development took into account the requirements of the EPA's Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity – Sector F (Primary Metals Facilities), which was re-issued on September 29, 2008. This EPA general permit applies to states in which EPA administers the NPDES Permit Program. The SWPPP requirement IDEM placed in the permit governs the requirements in the SWPPP for Gary Works, the latest revision of the Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity – Sector F (Primary Metals Facilities) were taken into account in developing the SWPPP.

The previous permit also included a BMP requirement for runoff control at the coal processing area. This BMP has been developed and implemented and now is included as part of the non-numeric permit limitations. The Coal processing area BMP was enacted in December 1994 and subsequently revised in April 1999 and April 2000. The BMP Runoff Control at the Coal Processing Area covered Outfall(s) 001, 003, and 004. Outfall(s) 001 and 003 have been eliminated. The related stormwater runoff was re-routed to the Outfall 004 system which currently does not discharge. US Steel is to maintain the BMP requirement for the Coal processing area that was implemented at the Gary Works Facility in April 1997 and must revise them according to the schedule in Part I.J.6 and Part I.J.7 of the permit.

A review of the current requirements for storm water monitoring is on a semi-annual basis, this has been retained in this permit. Part I. J. of the permit details the specific parameters and outfalls where these sampling and monitoring requirements are to be implemented. Monitoring at Outfalls 032 and 033 are included in the stormwater monitoring program as they are considered to have significant contributions of stormwater from the Bar Mill and Billet Storage Areas, Tin Plate Areas, Atmospheric Gas Plant and the Sheet Mill.

EPA has determined that non-numeric Technology-Based Effluent Limits have been determined to be equal to BPT/BAT/BCT for Stormwater associated with industrial activity.

The Non-Numeric Stormwater Conditions and Effluent Limits contain the technology-based effluent limitations. Effective implementation of these requirements should meet the applicable water quality based effluent limitations.

The non-numeric requirements of the permit contain effluent limitations, defined in the CWA as restrictions on quantities, rates, and concentrations of constituents which are discharged. Violation of any of these effluent limitations constitutes a violation of the permit.

The technology-based effluent limitations require the permittee to minimize exposure of raw, final, or waste materials to rain, snow, snowmelt, and runoff. In doing so, the permittee is required, to the extent technologically available and economically practicable and achievable, to either locate industrial materials and activities inside or to protect them with storm resistant coverings. In addition, the permittee is required to: (1) use good housekeeping practices to keep exposed areas clean, (2) regularly inspect, test, maintain and repair all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharges, (3) minimize the potential for leaks, spills and other releases that may be exposed to stormwater and develop plans for effective response to such spills if or when they occur, (4) stabilize exposed area and contain runoff using structural and/or non-structural control measures to minimize onsite erosion and sedimentation, and the resulting discharge of pollutants, (5) divert, infiltrate, reuse, contain or otherwise reduce stormwater runoff, to minimize pollutants in your discharges, (6) enclose or cover storage piles of salt or piles containing salt used for deicing or other commercial or industrial purposes, including maintenance of paved surfaces, (7) train all employees who work in areas where industrial materials or activities are exposed to stormwater, or who are responsible for implementing activities necessary to meet the conditions of this permit (e.g., inspectors, maintenance personnel), including all members of your Pollution Prevention Team, (8) ensure that waste, garbage and floatable debris are not discharged to receiving waters by keeping exposed areas free of such materials or by intercepting them before they are discharged, and (9) minimize generation of dust and off-site tracking of raw, final or waste materials.

To meet the non-numeric effluent limitations in Part I.J.3, the permit requires the US Steel to select control measures (including best management practices) to address the selection and design considerations in Part I.J.4.

The permittee must control its discharge as necessary to meet applicable water quality standards. It is expected that compliance with the technology-based effluent limitations and other terms and conditions in this permit will meet this effluent limitation. However, if at any time the permittee, or IDEM, determines that the discharge causes or contributes to an exceedance of applicable water quality standards, the permittee must take corrective actions, and conduct follow-up monitoring.

“Terms and Conditions” to Provide Information in a SWPPP

Distinct from the effluent limitation provisions in the permit, the permit requires the discharger to prepare a Stormwater Pollution Prevention Plan (SWPPP) for its facility. The SWPPP is intended to document the selection, design, installation, and implementation (including inspection, maintenance, monitoring, and corrective action) of

control measures being used to comply with the effluent limits set forth in Part I.J. of the permit. In general, the SWPPP must be kept up-to-date, and modified whenever necessary to reflect any changes in control measures that were found to be necessary to meet the effluent limitations in this permit.

The requirement to prepare a SWPPP is not an effluent limitation, rather it documents what practices the discharger is implementing to meet the effluent limitations in Part I.J. of the permit. The SWPPP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents which are discharged. Instead, the requirement to develop a SWPPP is a permit "term or condition" authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, "[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate." The SWPPP requirements set forth in this permit are terms or conditions under the CWA because the discharger is documenting information on how it intends to comply with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a SWPPP and keep it updated is no different than other information collection conditions, as authorized by section 402(a)(2), in other permits.

Reporting Requirements for Solvents, Degreasing Agents, Rolling Oils, Water Treatment Chemicals and Biocides (Water Treatment Additive Approvals and Requirements)

US Steel has on an annual basis reported the total quantity (lbs/year) of each solvent, degreasing agent, water treatment chemical, rolling oil and biocide that was purchased for that year. This requirement will continue as in the previous permit.

Visible Oil Corrective Action Monitoring Program

This was implemented as part of a Consent Decree through US EPA. Even though the consent decree is no longer in effect, the monitoring program still provides a useful service and this requirement is being carried over to the current permit. Much of the Oil and Grease issues at this facility are visible oil sheens and are not exceedances over numerical limits.

Water Treatment Additives

US Steel has submitted requests to use the water treatment additives listed below. US Steel has submitted water treatment additive information by email on November 18, 2002, with hard copies sent by mail. Review has been completed with the additives approved for use and are listed below by Outfall.

US Steel chlorinates the intake water to treat for zebra mussel they must also treat to remove the chlorine prior to the water being discharged. All outfalls receiving non-contact cooling water would have the Sodium Hypochlorite and ChemTreatBL 126. The permit allows for the treatment of zebra mussels to occur from April 1 to November 30 of

each year. US Steel has requested that this chlorination period be extended to treat for another species of Mussel the "Quagga" Mussel. The quagga mussel is able to tolerate a wider range of temperature extremes than the zebra mussel. The quagga mussel can tolerate temperatures as low as 42 degrees Fahrenheit, whereas the zebra mussel can only tolerate temperatures as low as 54 degrees. Temperatures on Lake Michigan between December and March over the last five years have been within a range that would allow for the quagga mussel to colonize within the piping systems. Therefore, year round chlorination and dechlorination at the Intakes are approved. Part I.P. of the permit has been modified to allow for year round chlorination.

The following water treatment additives have been approved at the following outfalls:

Outfall 005: CT-775, CT-930, CT-936, FO-120, P-817E, P-891L, P-825L, P-835E, CL-4074, P823L, Sodium Hypochlorite, ChemTreat CL1370, AP0200 Optisperse, AP0300 Optisperse, IS3000 Cortrol, IS104 Cortrol, NA0160 Steamate, ADJ1030 Optisperse, MPT101 Solicep, MDC700 Hypersperse, DCL30 BetzDearborn, Sodium Hypochlorite, Sodium Hydroxide, MCT511 Kleen, MCT103 Kleen, Muriatic Acid, Cortrol OS5300, and ChemTreat BL126.

Outfall 010: Sodium Hypochlorite, and ChemTreat BL126.

Outfall 015: P-891L, S-101, Sodium Hypochlorite, and ChemTreat BL126.

Outfall 018: ChemTreat CL1355, ChemTreat BL122, ChemTreat BL197, ChemTreat BL1351, ChemTreat BL1513, ChemTreat CL1376, ChemTreat BL126, ChemTreat CT-709, and Sodium Hypochlorite.

Outfall 019: ChemTreat CL5695, ChemTreat CL1355, ChemTreat BL122, ChemTreat BL197, ChemTreat BL1351, ChemTreat BL1513, ChemTreat CL1376, ChemTreat BL126, ChemTreat CT-709, and Sodium Hypochlorite.

Outfall 020: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 021: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 023: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 026: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 028: Sulfuric Acid, ChemTreat FO120, ChemTreat P891L, ChemTreat P813E, P817E, S101, Sodium Hypochlorite, Sodium Bisulfite, ChemTreat CL3857, ChemTreat CL4074, ChemTreat P841L, ChemTreat P894L, ChemTreat CL1355, ChemTreat CL4075, ChemTreat CL206, ChemTreat CL2840, Generic KOH and NaOH, ChemTreat 1370, ChemTreat CL4442, ChemTreat CL2005, ChemTreat CL2840, ChemTreat CL2900, ChemTreat CL4437, ChemTreat CL1427, CL-5695, ChemTreat CL49, ChemTreat CL4125, ChemTreat P873L, P895L, CL4800, Purate, and ChemTreat CL1375.

Outfall 030: Sulfuric Acid, ChemTreat FO120, ChemTreat P891L, ChemTreat P813E, P817E, S101, Sodium Hypochlorite, Sodium Bisulfite, ChemTreat CL3857, ChemTreat CL4074, ChemTreat P841L, ChemTreat P894L, ChemTreat CL1355, ChemTreat CL4075, ChemTreat CL206, ChemTreat CL2840, Generic KOH and NaOH, ChemTreat 1370, ChemTreat CL4442, ChemTreat CL2005, ChemTreat CL2840, CL-5695, ChemTreat CL2900, ChemTreat CL4437, ChemTreat CL1427, ChemTreat CL49, ChemTreat CL4125, ChemTreat P873L, P895L, and ChemTreat CL1375.

Outfall 032: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 033: ChemTreat BL126 and Sodium Hypochlorite.

Outfall 034: ChemTreat CT709, ChemTreat P802E, ChemTreat P813E, P802E, ChemTreat P841L, ChemTreat P846E, ChemTreat CT804, ChemTreat CT930, ChemTreat P8905L, ChemTreat P835E, ChemTreat P819L, Sodium Hypochlorite, ChemTreat C2189T, ChemTreat CL49, ChemTreat CT907, ChemTreat P873L, ChemTreat P891L, ChemTreat CL1439, CL454, ChemTreat BL126, ChemTreat BL1513, chlorine dioxide, Chem Treat Purate, copper sulfate and hydrogen peroxide.

Outfall 035: ChemTreat CL1355, ChemTreat CT-709, ChemTreat BL126 and Sodium Hypochlorite.

Outfall 037: ChemTreat CT709, ChemTreat CL4358, Sodium Hypochlorite, BL126, and Sodium Bisulfite.

Outfall 039: Sodium Hypochlorite, BL126 and Sodium Bisulfite.

Outfall 041A and Outfall 041B: Sodium Hypochlorite, BL126 and Sodium Bisulfite.

Thermal Effluent Requirements

US Steel has major non-contact discharges to both the Grand Calumet River and Lake Michigan. Temperature requirements related to direct discharges to the Grand Calumet River are found in 327 IAC 2-1.5-6(c)(4) and direct discharges to Lake Michigan are covered by 327 IAC 2-1.5-6(c)(4)(D). Compliance with temperature effluent limitations can be determined in two ways. The temperature limitations can either be met at the end of the pipe prior to discharge (discharges to stream segments without dilution) or can account for the mixing zone allowed by 327 IAC 2-1.5-8(c).

WQBELs are required for a discharge that causes, has the reasonable potential to cause, or contributes to an excursion above a water quality criterion. The data for Outfall 005 show that this discharge causes excursions of the water quality criteria for temperature. Therefore, WQBELs for temperature are required for Outfall 005 to ensure that the water quality criteria for temperature are met in the Grand Calumet River. The compliance point for the temperature requirements at Outfall 005 can be taken at a point up to 100 feet downstream of Outfall 005 and has been designated in the Permit as Outfall 205. The data for Outfalls 010, 018, 019, 020, 028, 030 and 034 indicate that these outfalls

would contribute to instream exceedances on many occasions if the instream exceedances that begin at Outfall 005 extend to these outfalls.

To ensure that the water quality criteria for temperature are met downstream of these outfalls, WQBELs will be applied downstream of Outfalls 020 and 030. Applying WQBELs downstream of Outfall 020 will ensure that the water quality criteria for temperature are maintained downstream of the three large discharges at Outfalls 018, 019 and 020. Due to the mixing and heat dissipation that can occur between Outfall 020 and Broadway, the current monitoring location at Broadway does not indicate whether a zone of passage is being maintained. Therefore, the current instream monitoring location at Broadway is being moved closer to Outfall 020. Applying WQBELs downstream of Outfall 030 will ensure that the water quality criteria for temperature are maintained downstream of the two warmest discharges at Outfalls 028 and 030. Compliance for the Temperature WQBEL have been determined to be approximately 100 feet downstream of Outfalls 005, 020, and 030 and have been designated as Outfalls 205, 220, and 230 respectively.

The outfalls that directly discharge to Lake Michigan will have effluent limits based upon requirements and temperature limitations established in 327 IAC 2-1.5-6(c)(4)(D). As part of the 1997 permit modification for the No. 5 Power Generating Station, a BTU limit of 1.211 million BTU per hour was placed at the Outfall 035 discharge. This limit was determined to be appropriate based upon the documentation submitted by US Steel and reviewed by IDEM and EPA. This limit is still appropriate to Outfall 035 and has been carried into this permit. As part of that modification a study was required to determine compliance with the temperature limits at the 1000 foot arc. US Steel submitted the thermal study that was required in the July 1997 permit modification in November 1997 and it was shown that at the thermal levels discharged through Outfall 035, the temperature requirements at the 1,000 foot arc were being met. Based upon this information and since Outfall 035 has the most significant heat impact to Lake Michigan it has been determined that the temperature requirements are met at the 1,000 foot arc by the remaining Lake Michigan Outfalls. For purposes of temperature monitoring at Outfalls 035, 037, and 039 temperature is to be monitored at the Intake and Outfall locations. Significant increases in heat discharge in the future may require additional studies to be performed.

A one year schedule of compliance is proposed to incorporate continuous temperature monitoring at the outfalls. To meet the new Temperature Limitations required by the permit a three year schedule of compliance is proposed. Information related to the time frames requested to meet these limits are detailed in the Compliance Schedule Section.

Section 316(b) Requirements

Section 316(b) of the federal Clean Water Act requires that facilities minimize adverse environmental impact resulting from the operation of cooling water intake structures (CWIS) by using the "best technology available" (BTA). U.S. EPA has promulgated rules to implement these requirements for new facilities (Phase I rules), large, existing power plants (Phase II rules) which are currently remanded, and offshore oil and gas extraction facilities (Phase III rules), and that implementation must take place through the

issuance of NPDES permits. However, there is a large universe of facilities which are not specifically addressed by the rules, including:

1. New facilities with a CWIS design flow less than 2 MGD;
2. Existing power plants with a CWIS design flow less than 50 MGD;
3. Manufacturing facilities such as existing steel mills, paper mills, etc. with a surface water intake that use at least a portion of their intake flow for cooling purposes.

U.S. EPA has recently emphasized that all of these facilities, including those not specifically addressed by rules must be evaluated for 316(b) compliance. 40 C.F.R. §125.90(b) directs permitting authorities to establish 316(b) requirements on a best professional judgment (BPJ) basis for existing facilities not subject to categorical section 316(b) regulations (Phase I, II (currently remanded) or III rules. IDEM is required to make a BTA determination using BPJ so the permit will comply with the federal regulation.

US Steel has submitted documentation on the design and operation of the CWISs at the Gary Works Facility through the permit application and a subsequent US EPA information request. IDEM and EPA conducted a site visit to examine the intake structures and better understand their operation. Following is a summary of the documentation submitted by US Steel for this facility.

The Gary Works Facility has operational CWIS that provide cooling water to various industrial processes throughout their complex. Pump Station No. 1, Pump Station No. 2, Pump Station No. 3, and Pump Station No. 4 are located within the ore loading slip of Gary Harbor extending inland from the shore of Lake Michigan onto USS property. Pump Station No. 3 is not currently in operation. The Lakeside Pump Station is situated along the southern shore of Lake Michigan on USS property with the intake structure positioned offshore a distance of 5,000 feet and at a lake depth of 28 feet.

US Steel conducted a 316(b) study in 1977 that examined impingement at the Lakeside and Pump Station No. 1. Pump Station No. 1 was determined to be representative of the other CWIS located in the ore loading slip due to its flow and location. The study also examined entrainment at the Lakeside Pump Station. Since that time, no additional studies have been conducted except for an impingement study conducted in March of 2008.

In the documentation submitted, US Steel has identified the following changes to the design of the CWIS since installation:

- Removal of the bar screens on the Lakeside Pumphouse off shore structure due to clogging from frazil ice and debris buildup.
- Replacement (re-build) of traveling screens was initiated in 2001. To date the focus has been on re-builds at Pump Station No. 1 and Pump Station No. 2. Approximately 3 re-builds are conducted per year, with Pump Station No. 4 being added to the schedule in the coming years. Screen mesh size is typically 1/8 to 1/4 of an inch.

- Intake structure heaters were disconnected prior to five (5) years ago.
- Pump Station No. 3, located in the ore loading slip of Gary Harbor, is not currently operated. It was last used in September 2006.
- Central Pump Station was discontinued in January 1994.

In the documentation submitted, US Steel has identified the following changes in operational conditions since the 1977 fish impingement and entrainment study including the following:

- A general reduction in water usage since the original study.
- A reduction in the number of pumps running simultaneously which is associated with a decrease in intake water demand due to demolition and removal of infrastructure processes in the 1980s, in conjunction with improvements in iron and steel production technologies.
- Current operation of the traveling screens at Pump Station No. 1, Pump Station No. 2, Pump Station No. 4, and the Lakeside Pump Station is conducted in manual mode during each visit of the Pump Station Rover for maintenance purposes, regardless of whether fish have been impinged (approximately every four hours). Prior to 2003, operation of the traveling screens was conducted electronically (automatic mode), and occurred only as needed.
- Intake through screen velocities at all operational intakes are below 0.5 ft/s at the screen face.

Based upon an evaluation of the documentation and information provided by US Steel, IDEM has made a BTA determination that the existing CWIS are BTA based upon BPJ for the following reasons:

- I. Based upon studies conducted for the development of the categorical 316(b) regulations, maintaining velocities below 0.5 ft/s allows most aquatic life to avoid impingement upon the intake structure. US Steel has documented that velocities at all of the intakes are below 0.5 ft/s and is considered to have minimized the adverse environmental impact from impingement. The permit requires US Steel to operate the CWISs in a manner that ensures that the through screen velocities do not exceed 0.5 ft/s.
- II. The available information indicates that the CWISs are located in areas such that entrainment is minimized. The Lakeside Pump Station has entrainment data from the 1977 study that indicates that the intake location minimizes the entrainment of aquatic life. The other CWIS are located in the ore loading slip. The ore loading slip is continually disturbed by vessel traffic and dredging activities and does not have optimal habitat for spawning or nursery purposes.

Some of the intakes also have fine screen mesh (1/8 inch or less) on the traveling screens. Based upon studies conducted for the development of the categorical 316(b) regulations, fine screen mesh was shown to minimize the entrainment of aquatic life. The available information leads to the conclusion that the existing CWIS minimize the adverse environment impact from entrainment.

The permit contains monitoring conditions to ensure that the identified BTA continues to operate in a manner that will minimize adverse environmental impact as follows:

- I. Entrainment – the permit requires a series of studies that will monitor the entrainment at the facility. The proposed studies should address the expected spawning period for the species of interest in determining sampling periods, document that the sampling techniques are appropriate for the water body, collect data sufficient to develop a scientifically valid estimate of potential entrainment impacts, and document that appropriate quality assurance/quality control procedures will be utilized. . The proposed studies should also include a description of the study area that identifies the area of influence of the CWIS. The studies will provide additional information regarding entrainment impacts for the BTA determination at the next permit renewal.

The entrainment studies will be conducted at Pump Station No. 2 and the Lakeside Pump Station. The water withdrawn through the intakes in the ore slip is returned to either Lake Michigan outside the ore slip or to the Grand Calumet River which creates a net flow of water into the ore slip from Lake Michigan. Pump Station No.2 should provide the most representative sampling of the water being drawn into the ore slip from the lake and any aquatic organisms entrained in that flow and be representative of the other CWISs.

US Steel is currently rebuilding some of the screens and is replacing some of the 1/8 inch mesh with 1/4 inch mesh. The annual studies can also be utilized to determine whether this changes the performance of the intakes in minimizing entrainment.

- II. Impingement – IDEM has included monitoring in the permit on a quarterly (seasonal) basis to confirm the velocities at the CWISs do not exceed 0.5 ft/s.

In 2003, the Gary Works Facility experienced a large impingement event at Pump Station No. 1. Pump Station No. 1 is unique in that it does not have a fish return but has baskets where impinged organisms are collected for disposal. IDEM has concerns that this event may not have been localized to this intake but may have been experienced at other intakes which have fish returns. US Steel conducted an impingement study in March 2008 at the Lakeside, Pump Station No.1 and Pump Station No. 2 CWISs that provided useful information for the BPJ BTA determination made in this permit.

IDEM has included a permit condition that requires US Steel to conduct a series of impingement studies for the life of this permit. The proposed studies should address the availability for impingement of the species of interest in determining

sampling periods, document that the sampling techniques are appropriate for the water body, collect data sufficient to develop a scientifically valid estimate of potential impingement impacts, and document that appropriate quality assurance/quality control procedures will be utilized. The proposed studies should also include a description of the study area that identifies the area of influence of the CWIS.

These impingement studies will be conducted at the Lakeside, Pump Station No. 1 and Pump Station No. 2 CWIS. These studies will provide an estimate of the impingement at the facility and will provide information regarding impingement impacts for the BTA determination at the next permit renewal.

Impingement mortality minimization is best achieved by technology that prevents impingement in the first place. However, screen wash systems and fish return systems play a critical role in minimizing the mortality of organisms if they are impinged in the intake structure. The site visit to the facility indicated that there might be areas for improvement in the fish return systems currently employed at the Gary Works Facility.

A permit condition has been included requiring US Steel to submit a report that assess options for improving the fish return systems at the CWIS to further minimize impingement mortality. IDEM will review that report and work with US Steel to implement options that will improve the survival of impinged organisms.

- III. IDEM will review the proposals for the studies and provide comments to US Steel to ensure that the data will meet the needs of IDEM in determining BTA at permit reissuance. US Steel and IDEM may agree that the scope of the subsequent studies required by the permit may be reduced if: 1) supporting data will show that the studies will continue to detect any seasonal variations in the number of individuals that are impinged or entrained and 2) that the studies will continue to provide a scientifically valid estimate of the adverse impacts for each CWIS.
- IV. The permit requires USS to provide advance notice to IDEM of any proposed changes to the CWISs or proposed changes to operations at the facility that affect the information taken into account in the current BTA evaluation.

Compliance Schedules

Compliance schedules have been included for Benzo(a)pyrene and Whole Effluent Toxicity (WET) at Outfall 005 and Benzo(a)pyrene at Outfall 010, and at all the Outfalls with numeric Mercury Limits.

Part III of the permit contains the compliance schedule for the new thermal effluent limits and continuous flow and temperature monitoring requirements.

ASSESSMENT OF NECESSITY FOR COMPLIANCE SCHEDULES

Benzo(a)pyrene

US Steel has new water quality based effluent limitations for Benzo(a)pyrene at Outfalls 005 and 010. US Steel has been operating under the interim permit effluent limitation of 1 ug/l as agreed upon in an existing Agreed Order. In order to justify the need for a compliance schedule current discharge data was used to determine immediate compliance with the final Water Quality Based Effluent Limitation. US Steel has reported a discharge of 0.25 ug/l monthly average and 0.99 ug/l at Outfall 005 and 0.089 ug/l and 0.16 ug/l for Outfall 010. Although the data at 010 is below the proposed limit it is only by 0.01 ug/l. US Steel submitted supporting information as to the need for a thirty four (34) month schedule at Outfall 005 and a twenty-four (24) month schedule at Outfall 010. This was used to develop the associated Schedules of Compliance in the permit. US Steel identified the necessity to design, procure and construct additional treatment facilities at the Coke Plant treatment to provide the additional treatment needed to meet the final limits at Outfall 005. This would take approximately 34 months.

US Steel intends to relocate the discharge from Outfall 010 to 005. This would eliminate the discharge from this Outfall. This will take approximately 24 months to accomplish and the schedule of compliance was determined based upon this time frame.

IDEM has reviewed their request and has granted the appropriate compliance schedules. The schedule of compliance shall require compliance as soon as reasonably possible, but not later than the timeframes within each schedule.

Whole Effluent Toxicity (WET) Limitations

Results of historic sampling performed at Outfall 005 are shown in the table below. These results equate to a 38% failure rate for chronic toxicity relative to the proposed 1.0 TUc limit listed in the draft permit and demonstrate significant chronic toxicity values when failures occur.

USS Gary Whole Effluent Toxicity (WET) Test Data – Outfall 005			
C. dubia (TUa)	C. dubia (TUc)	Fathead Minnow (TUa)	Fathead Minnow (TUc)
<1	8	<1	<1
<1	2	<1	<1
<1	<1	<1	<1
<1	2	<1	<1
<1	<1	<1	<1
<1	<1	<1	<1
<1	<1	<1	<1
<1	<1	<1	<1
<1	<1	<1	<1
<1	<1	<1	<1
<1	4	<1	<1
<1	2	<1	<1
<1	<1	<1	<1

During the treatability study of a technology (sand filtration) to further reduce B(a)P in Outfall 501 in order to achieve compliance with final B(a)P limits at Outfall 005, U. S. Steel conducted WET tests on Outfall 501 before filtration and after filtration. A dilution series of 0.5% to 10% mimics the range of percent effluent of 501 in Outfall 005. For example, using the average flows from Outfalls 005 and 501, if Outfall 501 is 1.5 MGD and Outfall 005 is 60.8 MGD, then the Outfall 005 discharge contains 2.5% of Outfall 501 discharge waters. In the dilution series in the study, using Outfall 005 flow of 60.8 MGD, 0.5% contribution from Outfall 501 equates to 0.3 MGD at Outfall 501 and 10% equates to 6 MGD at Outfall 501.

Toxicity test results from a 2008 Sand Filter Pilot Test conducted for Outfall 501 discharge waters at the sand filter inlet were as follows (values in the table denote the percentage of Outfall 501 wastewater mimicked in the study – it should be noted that the actual Outfall 501 discharge is approximately 2.5% of the Outfall 005 discharge flow):

Outfall 501 Toxicity Test Results – Sand Filter Inlet

Toxicity	Fathead Minnow	C. dubia
LC50 (acute)	>10% (96-hour)	>10% (48-hour)
NOEC Value Survival	10%	10%
NOEC Value Growth/Reproduction	5%	2%
IC25 Value	>10%	4.1%

Results of the test with sand filter influent samples indicated no acute toxicity to either species. However, sublethal chronic toxicity was indicated for both species. The No Observed Effect Concentration (NOEC) values were five and two percent, respectively. Growth of fathead minnow was inhibited at the 10 percent inlet concentration. Reproduction of the *C. dubia* was inhibited at 5 percent inlet concentration based on the NOEC value; and the IC25 value indicated inhibition at 4.1 percent of the inlet water. The IC25 value is the value (%) at which 25 percent of the organisms were affected or inhibited.

Toxicity test results from a 2008 Sand Filter Pilot Test conducted for Outfall 501 discharge waters at the sand filter effluent were as follows (values in the table denote the percentage of Outfall 501 wastewater mimicked in the study – it should be noted that the actual Outfall 501 discharge is approximately 2.5% of the Outfall 005 discharge flow):

Outfall 501 Toxicity Test Results – Sand Filter Effluent

Toxicity	Fathead Minnow	C. dubia
LC50 (acute)	10% (96-hour)	10% (48-hour)
NOEC Value Survival	10%	10%
NOEC Value Growth/Reproduction	10%	10%
IC25 Value	>10%	6.8%

Results of the test with sand filter effluent indicated no acute or chronic toxicity to fathead minnows. No acute toxicity was indicated for the *C. dubia*. In addition, the NOEC effect concentration increased from 2 percent to 10 percent effluent dilution and the chronic IC25 value increased from 4.1 percent to 6.8 percent effluent.

Therefore, as Outfall 501 constitutes 2.5% of the Outfall 005 discharge flow and toxicity seen post filtration would require a 6.8% or greater contribution (4 MGD or greater) of Outfall 501 flow at Outfall 005, these results indicate that sand filtration of Outfall 501 was effective in reducing chronic toxicity. The reduction of chronic toxicity at Outfall 501 would result in a reduction of chronic toxicity at Outfall 005. In considering what components are reduced due to sand filtration of 501 that could impact the chronic response of invertebrates (as tested with *C. dubia*), U. S. Steel believes a major component is the polyaromatic hydrocarbons, of which B(a)P is an indicator chemical, found in treated coke plant wastewater. This is supported by the following references that can be provided to USEPA and IDEM if needed:

- Bisson, M, Dujardin, R, Flammarion, P, Garric, J, Babut, M, Lamy, MH, Porcher, JM, Thybaud, E, Vindimian, E. Complement au SEQ Eau: Methode de determination des seuils de qualite ppour les substances genotoxiques. 2000. 00/0763 (PUB).CBELY.7770(LY). 151 p.
- M. Feldmannova , K. Hilscherova , B. Marsalek, L. Blaha. Effects of N-Heterocyclic Polyaromatic Hydrocarbons on Survival, Reproduction, and Biochemical Parameters in *Daphnia magna*. 2006. RECETOX—Research Centre for Environmental Chemistry and Ecotoxicology,
- Masaryk University, Kamenice 126/3, CZ 625 00 Brno, Czech Republic Centre for Cyanobacteria and Their Toxins, Institute of Botany, Czech Academy of Science,
- Kvetna 8, CZ 603 65 Brno, Czech Republic
- Holst, L.L. and J.P. Giesy, 1989. Chronic Effects of the Photo-enhanced Toxicity of Anthracene on *Daphnia Magna* Reproduction. *Environmental Toxicology and Chemistry*, Vol.8. pp 933-942.
- D. R. Passino-Reader, J. P. Hickey, L. M. Ogilvie. 1997. Toxicity to *Daphnia pulex* and QSAR Predictions for Polycyclic Hydrocarbons Representative of Great Lakes Contaminants. *Bull. Environ. Contam. Toxicol.* (1997) 59:834-840.
- D. Scott Ireland, G. Allen Burton, Jr. and George G. Hess. In-Situ Toxicity Evaluations of Turbidity and Photoinduction of Polycyclic Aromatic Hydrocarbons. 1996. *Environmental Toxicology and Chemistry*, Vol. 15, No. 4, pp. 574–581.
- I.C. Eom, C. Rast, A.M. Veber and P. Vasseur, Ecotoxicity of a polycyclic aromatic hydrocarbon (PAH)-contaminated soil. 2007. [Ecotoxicology and Environmental Safety](#) [Volume 67, Issue 2](#), Pages 190-205

Considering the results of this study and the referenced literature, the reduction of toxicity at Outfall 501 should positively affect toxicity at Outfall 005. Therefore, U. S. Steel requests a compliance schedule to allow sufficient time to develop a treatment regime for WET at Outfall 005 to achieve compliance through the installation of a filtration system. U. S. Steel anticipates the compliance schedule for WET will parallel the compliance schedule for B(a)P at Outfall 005. IDEM and EPA have reviewed this information and consider it appropriate to include a schedule of compliance for WET at Outfall 005. Since B(a)P is an indicator chemical for the cause of the toxicity and USS is installing the treatment technologies to remove B(a)P and other components to meet WET and B(a)P WQBEL's the compliance schedule for WET will be the same as the one for B(a)P at Outfall 005.

Mercury for Outfalls 005, 010, 015, 018, 019, 020, 028/030, and 034

US Steel cannot currently comply with the draft final daily maximum concentration, daily maximum mass, monthly average concentration, or monthly average concentration limits for mercury at Outfalls 005, 010, 015, 018, 019, 020, 028/030, and 034. There are no current limits for mercury at any of these outfalls. The draft final concentration limits for mercury is 0.0032 µg/L (daily maximum) and 0.0013 µg/L (monthly average). From data generated by US Steel during the Permit Renewal process, the projected effluent quality (PEQ) for mercury at the outfalls is (as presented in Attachment IV tables):

	Daily Maximum	Monthly Average
Outfall 005	0.00707 µg/L	0.00707 µg/L
Outfall 010	0.00578 µg/L	0.00578 µg/L
Outfall 015	0.00612 µg/L	0.00612 µg/L
Outfall 018	0.00593 µg/L	0.00593 µg/L
Outfall 019	0.00726 µg/L	0.00726 µg/L
Outfall 020	0.02474 µg/L	0.02474 µg/L
Outfall 028/030	0.00334 µg/L	0.00361 µg/L
Outfall 034	0.00304 µg/L	0.00304 µg/L

ACTIONS TO ACHIEVE COMPLIANCE – Mercury

US Steel will need to take actions to achieve compliance with the water quality-based effluent limits presented above. Though exact actions have not been identified, due to the source and nature of the constituents listed above end-of-pipe treatment will be required.

The identification, evaluation, engineering design, procurement, construction, modification of permits to allow construction and start-up of new end-of-pipe treatment facilities that could bring these outfalls into compliance with the final discharge limits could take five (5) years. US Steel shall complete an engineering review by December 31, 2009 and an engineering review report summarizing findings from the review of mercury control technologies by February 28, 2010. The compliance schedule includes timeframes for the selection of control technologies and the installation of mercury control technologies. These are outlined in Part I.E. of the permit.

ASSESSMENT OF COMPLIANCE – Temperature

Temperature for River Monitoring Point 205, River Monitoring Point 220, River Monitoring Point 230 and Continuous Temperature Monitoring.

US Steel cannot comply with temperature limits (1% over standard and not-to-exceed standard+3°F) based on the limited data available at these monitoring locations. Of most concern for compliance is the temperature limits for October through March. Based on the data available at these monitoring locations, temperature data on the outfalls, and temperature data for the intakes, engineering options could involve either end-of-pipe treatment or novel in-River technologies to reduce temperature. In addition, as continuous monitoring equipment is currently not installed at Outfall 037, 039, at River Monitoring Point 205, River Monitoring Point 220, and River Monitoring Point 230, a one-year period is allowed to select, procure, install, calibrate, and start-up the equipment. Based on installing continuous temperature monitoring devices at other locations, this one-year time period is appropriate. It should be noted that temperature will be monitored at the specified locations as grab samples.

US Steel submitted an example of activities that occur in support of engineering, installing, and starting up temperature controls to assure consistent compliance with the temperature limits at the three monitoring locations is:

0-24 Months: Gather more temperature data, particularly needed for October to March
12-24 Months: Develop temperature model to predict impact of temperature control technologies given intake, climate, and thermal load
12-24 Months: Conduct temperature ‘treatability’ studies on technologies (as needed)
22-28 Months: Preliminary design of effective technologies
28-32 Months: Considering multi-media impacts, operability, reliability, and cost, select preferred technology and begin process of approvals
30-39 Months: Detailed design of selected technology and final approvals of projects
37-40 Months: Wastewater construction permit application and/or air permit modification
40 Month: With approval of these permits, apply for NPDES Permit Modification
41 Month: Procurement activities
44 Month: Construction activities
55 Month: NPDES Permit Modification in effect
56 Month: Start-up of engineering controls
60 Month: Final Limits in effect

IDEM has reviewed the above compliance schedule timeline related to Temperature provided by US Steel and has determined that a three year schedule is appropriate. Some of the preliminary items listed above can be done concurrently and stay within the three years given. It is not clear if a construction permit or a permit modification would be required at this time.

Procedures for Participating in the Formulation of a Final Decision

327 IAC 5-3-9 Public comments and public hearings.

The draft action shall be issued as a final action unless a revision of the draft occurs after consideration of a public meeting or written comment, or upon disapproval by the Administrator of the US Environmental Protection Agency.

Within 30 days from the date of Public Notice, any person may request or petition for a public meeting or hearing. Requests for public meeting shall be made in writing and shall state the action of the Commissioner objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Indiana Department of Environmental Management
Office of Water Quality - Mail Code 65-42
Permits Section
100 North Senate Avenue
Indianapolis, Indiana 46204-2251

Notice of Final Permit Determination

Any person who is interested in receiving notice of the final agency determination on this permit application is requested to notify the agency at the above address during the specified comment period. Notice of final permit action will not be made to persons who fail to comment on the proposed permit or to request such notice.

Availability of Additional Information

The application, proposed permit, including effluent limitations and special conditions, and wasteload allocation study, comments received, and any other information are on file and may be inspected at Indiana Government Center North on the 12th floor in Room 1203, Indiana Department of Environmental Management, 100 North Senate Avenue, Indianapolis, Indiana, at any time between 9:00 a.m., and 4:00 p.m., Monday through Friday. Copies of this Public Notice and the proposed permit are available at the Indiana Department of Environmental Management. All of these documents may be copied at a cost of 10¢ per page. A copy of the proposed permit is also on file with the local health department and is available for public review. Please bring the foregoing to the attention of persons whom you know would be interested in this matter.

Please tell others you think would be interested in this matter. For information about your rights and responsibilities pertaining to the Public Notice process and timeframes, please refer to the following IDEM websites: <http://www.in.gov/idem/5474.htm> and IDEM Permit Guide (Public Participation): <http://www.in.gov/idem/4172.htm>. **To view the Citizen Guide go to:** <http://www.in.gov/idem/5803.htm>.